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THE PHILOSOPHY OF

JOHN STUART MILL,

AS CONTAINED IN
EXTRACTS FROM HIS OWN WRITINGS.

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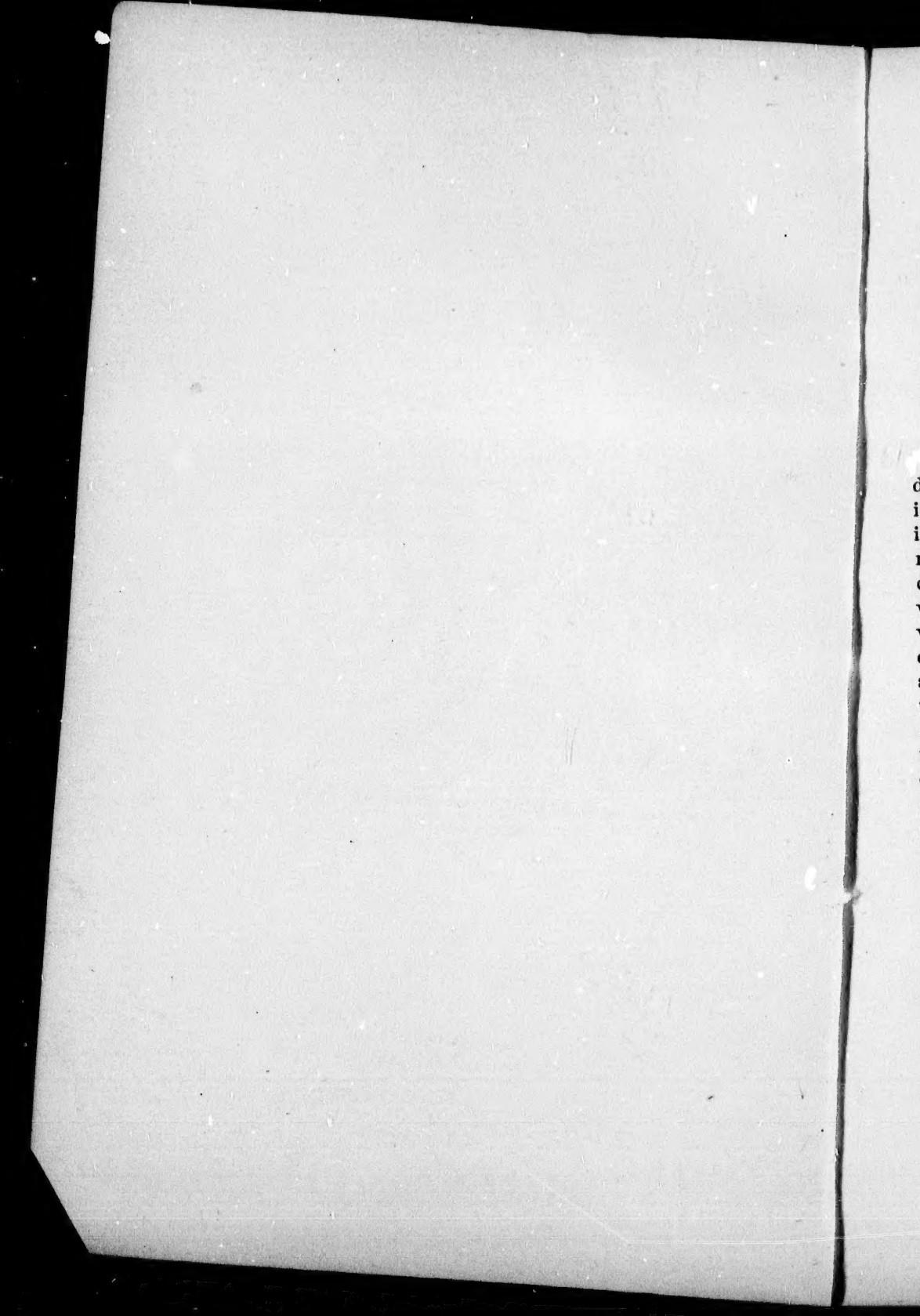
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PHILOSOPHY OF JOHN STUART MILL.

LOGIC—BOOK II.

CHAPTER V.

OF DEMONSTRATION AND NECESSARY TRUTHS.

§ 1. If, as laid down in the two preceding chapters, the foundation of all sciences, even deductive or demonstrative sciences, is Induction; if every step in the ratiocinations even of geometry is an act of induction; and if a train of reasoning is but bringing many inductions to bear upon the same subject of inquiry, and drawing a case within one induction by means of another; wherein lies the peculiar certainty always ascribed to the sciences which are entirely, or almost entirely, deductive? Why are they called the Exact Sciences? Why are mathematical certainty, and the evidence of demonstration, common phrases to express the very highest degree of assurance attainable by reason? Why are mathematics by almost all philosophers, and (by many) even those branches of natural philosophy which, through the medium of mathematics, have been converted into deductive sciences, considered to be independent of the evidence of experience and observation, and characterized as systems of Necessary Truth?

The answer I conceive to be, that this character of necessity, ascribed to the truths of mathematics, and even (with some reservations to be hereafter made) the peculiar certainty attributed to them, is an illusion; in order to sustain which, it is necessary to suppose that those truths relate to, and express the properties of, purely imaginary objects. It is acknowledged that the conclusions of geometry are deduced, partly at least, from the so-called Definitions, and that those definitions are assumed to be correct descriptions, as far as they go, of the objects with which geometry is conversant. Now we have pointed out that, from a definition as such, no proposition, unless it be one concerning the meaning of a word, can ever follow; and that what apparently

follows from a definition, follows in reality from an implied assumption that their exists a real thing conformable thereto. This assumption, in the case of the definitions of geometry, is false: there exist no real things exactly conformable to the definitions. There exist no points without magnitude; no lines without breadth, nor perfectly straight; no circles with all their radii exactly equal, nor squares with all their angles perfectly right. It will perhaps be said that the assumption does not extend to the actual, but only to the possible, existence of such things. I answer that, according to any test we have of possibility, they are not even possible. Their existence, so far as we can form any judgment, would seem to be inconsistent with the physical constitution of our planet at least, if not of the universe. To get rid of this difficulty, and at the same time to save the credit of the supposed systems of necessary truth, it is customary to say that the points, lines, circles, and squares which are the subject of geometry, exist in our conceptions merely, and are part of our minds; which minds, by working on their own materials, construct an *a priori* science, the evidence of which is purely mental, and has nothing whatever to do with outward experience. By howsoever high authorities this doctrine may have been sanctioned, it appears to me psychologically incorrect. The points, lines, circles, and squares, which any one has in his mind, are (I apprehend) simply copies of the points, lines, circles, and squares which he has known in his experience. A line as defined by geometers is wholly inconceivable. We can reason about a line as if it had no breadth; because we have a power, which is the foundation of all the control we can exercise over the operations of our minds; the power, when a perception is present to our senses, or a conception to our intellects, of attending to a part only of that perception or conception, instead of the whole. But we cannot conceive a line without breadth; we can form no mental picture of such a line; all the lines which we have in our minds are lines possessing breadth. If any one doubts this, we may refer him to his own experience. I much question if any one who fancies that he can conceive what is called a mathematical line, thinks so from the evidence of his consciousness: I suspect

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it is rather because he supposes that unless such a conception were possible, mathematics could not exist as a science: a supposition which there will be no difficulty in showing to be entirely groundless.

Since then neither in nature, nor in the human mind, do there exist any objects exactly corresponding to the definitions of geometry, while yet that science cannot be supposed to be conversant about non-entities; nothing remains but to consider geometry as conversant with such lines, angles, and figures as really exist; and the definitions, as they are called, must be regarded as some of our first and most obvious generalizations concerning those natural objects. The correctness of those generalizations, *as generalizations*, is without a flaw: the equality of all the radii of a circle is true of all circles, so far as it is true of any one: but it is not exactly true of any circle: it is only nearly true, so nearly that no error of any importance in practice will be incurred by feigning it to be exactly true. When we have occasion to extend these inductions, or their consequences, to cases in which the error would be appreciable—to lines of perceptible breadth or thickness, parallels which deviate sensibly from equidistance, and the like—we correct our conclusions, by combining with them a fresh set of propositions relating to the aberration; just as we also take in propositions relating to the physical or chemical properties of the material, if those properties happen to introduce any modification into the result, which they easily may, even with respect to figure and magnitude, as in the case, for instance, of expansion by heat. So long, however, as there exists no practical necessity for attending to any of the properties of the object, except its geometrical properties, or to any of the natural irregularities in those, it is convenient to neglect the consideration of the other properties and of the irregularities, and to reason as if these did not exist: accordingly, we formally announce, in the definitions, that we intend to proceed on this plan. But it is an error to suppose, because we resolve to confine our attention to a certain number of the properties of an object, that we therefore conceive, or have an idea of, the object, denuded of its other properties. We are thinking, all the time, of

precisely such objects as we have seen and touched, and with all the properties which naturally belong to them; but for scientific convenience, we feign them to be divested of all properties, except those which are material to our purpose, and in regard to which we design to consider them.

The peculiar accuracy, supposed to be characteristic of the first principles of geometry, thus appears to be fictitious. The assertions on which the reasonings of the science are founded, do not, any more than in other sciences, exactly correspond with the fact; but we *suppose* that they do so, for the sake of tracing the consequences which follow from the supposition. The opinion of Dugald Stewart respecting the foundations of geometry, is, I conceive, substantially correct; that it is built upon hypotheses; that it owes to this alone the peculiar certainty supposed to distinguish it; and that in any science whatever, by reasoning from a set of hypotheses, we may obtain a body of conclusions as certain as those of geometry, that is, as strictly in accordance with the hypotheses, and as irresistibly compelling assent, *on condition* that those hypotheses are true.

When, therefore, it is affirmed that the conclusions of geometry are necessary truths, the necessity consists in reality only in this, that they necessarily follow from the suppositions from which they are deduced. These suppositions are so far from being necessary, that they are not even true; they purposely depart, more or less widely, from the truth. The only sense in which necessity can be ascribed to the conclusions of any scientific investigation, is that of necessarily following from some assumption, which, by the conditions of the inquiry, is not to be questioned. In this relation of course, the derivative truths of every deductive science must stand to the inductions, or assumptions, on which the science is founded, and which, whether true or untrue, certain or doubtful in themselves, are always supposed certain for the purposes of the particular science. And therefore the conclusions of all deductive sciences were said by the ancients to be necessary propositions. We have observed already that to be predicated necessarily was characteristic of the predicate Proprium, and that a proprium was any property of a thing.

which could be deduced from its essence, that is, from the properties included in its definition.

§ 2. The important doctrine of Dugald Stewart, which I have endeavored to enforce, has been contested by Dr. Whewell, both in the dissertation appended to his excellent *Mechanical Euclid*, and in his more recent elaborate work on the *Philosophy of the Inductive Sciences*; in which last he also replies to an article in the *Edinburgh Review*, (ascribed to a writer of great scientific eminence) in which Stewart's opinion was defended against his former strictures. The supposed refutation of Stewart consists in proving against him (as has also been done in this work) that the premisses of geometry are not definitions, but assumptions of the real existence of things corresponding to those definitions. This, however, is doing little for Dr. Whewell's purpose; for it is these very assumptions which are asserted to be hypotheses, and which he, if he denies that geometry is founded on hypotheses, must show to be absolute truths. All he does, however, is to observe, that they at any rate are not *arbitrary* hypotheses; that we should not be at liberty to substitute other hypotheses for them; that not only "a definition, to be admissible, must necessarily refer to and agree with some conception which we can distinctly frame in our thoughts," but that the straight lines, for instance, which we define, must be "those by which angles are contained, those by which triangles are bounded, those of which parallelism may be predicated, and the like."* And this is true; but this has never been contradicted. Those who say that the premisses of geometry are hypotheses, are not bound to maintain them to be hypotheses which have no relation whatever to fact. Since an hypothesis framed for the purpose of scientific inquiry must relate to something which has real existence, (for there can be no science respecting non-entities,) it follows that any hypothesis we make respecting an object, to facilitate our study of it, must not involve anything which is distinctly false, and repugnant to its real nature: we must not ascribe to the thing any property which it has not; our liberty extends only to sup-

* *Mechanical Euclid*, pp. 149, et seqq.

pressing some of those which it has, under the indispensable obligation of restoring them whenever, and in as far as, their presence or absence would make any material difference in the truth of our conclusions. Of this nature, accordingly, are the first principles involved in the definitions of geometry. In their positive part they are observed facts; it is only in their negative part that they are hypothetical. That the hypotheses should be of this particular character, is, however, no further necessary, than inasmuch as no others could enable us to deduce conclusions which, with due corrections, would be true of real objects: and in fact when our aim is only to illustrate truths and not to investigate them, we are not under any such restriction. We might suppose an imaginary animal, and work out by deduction, from the known laws of physiology, its natural history; or an imaginary commonwealth, and from the elements composing it, might argue what would be its fate. And the conclusions which we might thus draw from purely arbitrary hypotheses, might form a highly useful intellectual exercise: but as they could only teach us what *would* be the properties of objects which do not really exist, they would not constitute any addition to our knowledge: while on the contrary, if the hypothesis merely divests a real object of some portion of its properties, without clothing it in false ones, the conclusions will always express, under known liability to correction, actual truth.

§ 3. But although Dr. Whewell has not shaken Stewart's doctrine as to the hypothetical character of that portion of the first principles of geometry which are involved in the so-called definitions, he has, I conceive, greatly the advantage of Stewart on another important point in the theory of geometrical reasoning; the necessity of admitting, among those first principles, axioms as well as definitions. Some of the axioms of Euclid might, no doubt, be exhibited in the form of definitions, or might be deduced, by reasoning, from propositions similar to what are so called. Thus if instead of the axiom, Magnitudes which can be made to coincide are equal, we introduce a definition, "Equal magnitudes are those which may be so applied to one another as to coincide;" the three axioms which follow, (Magnitudes which are equal to the same are equal

to one another—If equals are added to equals the sums are equal—If equals are taken from equals the remainders are equal,) may be proved by an imaginary superposition, resembling that by which the fourth proposition of the first book of Euclid is demonstrated. But although these and several others may be struck out of the list of first principles, because though not requiring demonstration, they are susceptible of it; there will be found in the list of axioms two or three fundamental truths, not capable of being demonstrated: among which must be reckoned the proposition that two straight lines cannot inclose a space, (or its equivalent, straight lines which coincide in two points coincide altogether,) and some property of parallel lines, other than that which constitutes their definition: the most suitable, perhaps, being that selected by Professor Playfair: "Two straight lines which intersect each other cannot both of them be parallel to a third straight line."

The axioms, as well those which are indemonstrable as those which admit of being demonstrated, differ from that other class of fundamental principles which are involved in the definitions, in this, that they are true without any mixture of hypothesis. That things which are equal to the same thing are equal to one another, is as true of the lines and figures in nature, as it would be of the imaginary ones assumed in the definitions. In this respect, however, mathematics are only on a par with most other sciences. In almost all sciences there are some general propositions which are exactly true, while the greater part are only more or less distant approximations to the truth. Thus in mechanics, the first law of motion (the continuance of a movement once impressed, until stopped or slackened by some resisting force) is true without qualification or error. The rotation of the earth in twenty-four hours, of the same length as in our time, has gone on since the first accurate observations, without the increase or diminution of one second in all that period. These are inductions which require no fiction to make them be received as accurately true: but along with them there are others, as for instance the propositions respecting the figure of the earth, which are but approximations to the truth; and in order to use them for the further advancement of our knowledge, we must feign that

they are exactly true, though they really want something of being so.

§ 4. It remains to inquire, what is the ground of our belief in axioms—what is the evidence on which they rest? I answer, they are experimental truths; generalizations from observation. The proposition, Two straight lines cannot inclose a space—or in other words, Two straight lines which have once met do not meet again, but continue to diverge—is an induction from the evidence of our senses.

This opinion runs counter to a scientific prejudice of long standing and great strength, and there is probably no one proposition enunciated in this work for which a more unfavourable reception is to be expected. It is, however, no new opinion; and even if it were so, would be entitled to be judged, not by its novelty, but by the strength of the arguments by which it can be supported. I consider it very fortunate that so eminent a champion of the contrary opinion as Dr. Whewell, has recently found occasion for a most elaborate treatment of the whole theory of axioms, in attempting to construct the philosophy of the mathematical and physical sciences on the basis of the doctrine against which I now contend. Whoever is anxious that a discussion should go to the bottom of the subject, must rejoice to see the opposite side of the question worthily represented. If what is said by Dr. Whewell, in support of an opinion which he has made the foundation of a systematic work, can be shown not to be conclusive, enough will have been done without going further to seek stronger arguments and a more powerful adversary.

It is not necessary to show that the truths which we call axioms are originally *suggested* by observation, and that we should never have known that two straight lines cannot inclose a space if we had never seen a straight line: thus much being admitted by Dr. Whewell, and by all, in recent times, who have taken his view of the subject. But they contend, that it is not experience which *proves* the axiom; but that its truth is perceived *a priori*, by the constitution of the mind itself, from the first moment when the meaning of the proposition is apprehended; and without any necessity for verifying it by repeated trials, as is requisite in the case of truths really ascertained by observation.

They cannot, however, but allow that the truth of the axiom, Two straight lines cannot inclose a space, even if evident independently of experience, is also evident from experience. Whether the axiom *needs* confirmation or not, it *receives* confirmation in almost every instant of our lives; since we cannot look at any two straight lines which intersect one another, without seeing that from that point they continue to diverge more and more. Experimental proof crowds in upon us in such endless profusion, and without one instance in which there can be even a suspicion of an exception to the rule, that we should soon have a stronger ground for believing the axiom, even as an experimental truth, than we have for almost any of the general truths which we confessedly learn from the evidence of our senses. Independently of *a priori* evidence, we should certainly believe it with an intensity of conviction far greater than we accord to any ordinary physical truth: and this too at a time of life much earlier than that from which we date almost any part of our acquired knowledge, and much too early to admit of our retaining any recollection of the history of our intellectual operations at that period. Where then is the necessity for assuming that our recognition of these truths has a different origin from the rest of our knowledge, when its existence is perfectly accounted for by supposing its origin to be the same? when the causes which produce belief in all other instances, exist in this instance, and in a degree of strength as much superior to what exists in other cases, as the intensity of the belief itself is superior? The burden of proof lies on the advocates of the contrary opinion: it is for them to point out some fact, inconsistent with the supposition that this part of our knowledge of nature is derived from the same sources as every other part.

This, for instance, they would be able to do, if they could prove chronologically that we had the conviction (at least practically) so early in infancy as to be anterior to those impressions on the senses, upon which, on the other theory, the conviction is founded. This, however, cannot be proved: the point being too far back to be within the reach of memory, and too obscure for external observation. The advocates of the *a priori* theory are obliged to have recourse to other arguments. These are

reducible to two, which I shall endeavour to state as clearly and as forcibly as possible.

§ 5. In the first place it is said, that if our assent to the proposition that two straight lines cannot inclose a space, were derived from the senses, we could only be convinced of its truth by actual trial, that is, by seeing or feeling the straight lines; whereas in fact it is seen to be true by merely thinking of them. That a stone thrown into water goes to the bottom, may be perceived by our senses, but mere thinking of a stone thrown into the water would never have led us to that conclusion: not so, however, with the axioms relating to straight lines: if I could be made to conceive what a straight line is, without having seen one, I should at once recognize that two such lines cannot inclose a space. Intuition is "imaginary looking;"* but experience must be real looking: if we see a property of straight lines to be true by merely fancying ourselves to be looking at them, the ground of our belief cannot be the senses, or experience; it must be something mental.

To this argument it might be added in the case of this particular axiom, (for the assertion would not be true of all axioms,) that the evidence of it from actual ocular inspection, is not only unnecessary, but unattainable. What says the axiom? That two straight lines *cannot* inclose a space; that after having once intersected, if they are prolonged to infinity they do not meet, but continue to diverge from one another. How can this, in any single case, be proved by actual observation? We may follow the lines to any distance we please; but we cannot follow them to infinity: for aught our senses can testify, they may, immediately beyond the farthest point to which we have traced them, begin to approach, and at last meet. Unless, therefore, we had some other proof of the impossibility than observation affords us, we should have no ground for believing the axiom at all.

To these arguments, which I trust I cannot be accused of understating, a satisfactory answer will, I conceive, be found, if we advert to one of the characteristic properties of geometrical

* Whewell's *Philosophy of the Inductive Sciences*, i. 180.

forms—their capacity of being painted in the imagination with a distinctness equal to reality: in other words, the exact resemblance of our ideas of form to the sensations which suggest them. This, in the first place, enables us to make (at least with a little practice) mental pictures of all possible combinations of lines and angles, which resemble the realities quite as well as any which we could make on paper; and in the next place, makes those pictures just as fit subjects of geometrical experimentation as the realities themselves; inasmuch as pictures, if sufficiently accurate, exhibit of course all the properties which would be manifested by the realities at one given instant, and on simple inspection: and in geometry we are concerned only with such properties, and not with that which pictures could not exhibit, the mutual action of bodies one upon another. The foundations of geometry would therefore be laid in direct experience, even if the experiments (which in this case consist merely in attentive contemplation) were practiced solely upon what we call our ideas, that is, upon the diagrams in our minds, and not upon outward objects. For in all systems of experimentation we take some objects to serve as representatives of all which resemble them; and in the present case the conditions which qualify a real object to be the representative of its class, are completely fulfilled by an object existing only in our fancy. Without denying, therefore, the possibility of satisfying ourselves that two straight lines cannot enclose a space, by merely thinking of straight lines without actually looking at them; I contend, that we do not believe this truth on the ground of the imaginary intuition simply, but because we know that the imaginary lines exactly resemble real ones, and that we may conclude from them to real ones with quite as much certainty as we could conclude from one real line to another. The conclusion, therefore, is still an induction from observation. And we should not be authorized to substitute observation of the image in our mind, for observation of the reality, if we had not learnt by long-continued experience that the properties of the reality are faithfully represented in the image; just as we should be scientifically warranted in describing an animal which we had never seen, from a picture made of it with

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These considerations also remove the objection arising from the impossibility of ocularly following the lines in their prolongation to infinity. For though, in order actually to see that two given lines never meet, it would be necessary to follow them to infinity: yet without doing so we may know that if they ever do meet, or if, after diverging from one another, they begin again to approach, this must take place not at an infinite, but at a finite distance. Supposing, therefore, such to be the case, we can transport ourselves thither in imagination, and can frame a mental image of the appearance which one or both of the lines must present at that point, which we may rely on as being precisely similar to the reality. Now, whether we fix our contemplation upon this imaginary picture, or call to mind the generalizations we have had occasion to make from former ocular observation, we learn by the evidence of experience, that a line which, after diverging from another straight line, begins to approach to it, produces the impression on our senses which we describe by the expression, "a bent line," not by the expression, "a straight line."

§ 6. The first of the two arguments in support of the theory that axioms are *a priori* truths, having, I think, been sufficiently answered; I proceed to the second, which is usually the most relied on. Axioms (it is asserted) are conceived by us not only as true, but as universally and necessarily true. Now, experience cannot possibly give to any proposition this character. I may have seen snow a hundred times, and may have seen that it was white, but this cannot give me entire assurance even that all snow is white; much less that snow *must* be white. "However many instances we may have observed of the truth of a proposition, there is nothing to assure us that the next case shall not be an exception to the rule. If it be strictly true that every ruminant animal yet known has cloven hoofs, we still cannot be sure that some creature will not hereafter be discovered which has the first of these attributes, without having the other..... Experience

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tion arising from cases in their processes; actually to see that they follow them now that if they another, they be not at an infinite, such to be the imagination, and can h one or both of e may rely on as whether we fix our call to mind the former ocular dence, that a line he, begins to appear in the expression,

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must always consist of a limited number of observations; and, however numerous these may be, they can show nothing with regard to the infinite number of cases in which the experiment has not been made." Besides, axioms are not only universal, they are also necessary. Now "experience cannot offer the smallest ground for the necessity of a proposition. She can observe and record what has happened; but she cannot find, in any case, or in any accumulation of cases, any reason for what *must* happen. She may see objects side by side; but she cannot see a reason why they must ever be side by side. She finds certain events to occur in succession; but the succession supplies, in its occurrence, no reason for its recurrence. She contemplates external objects; but she cannot detect any internal bond, which indissolubly connects the future with the past, the possible with the real. To learn a proposition by experience, and to see it to be necessarily true, are two altogether different processes of thought."* And Dr. Whewell adds, "If any one does not clearly comprehend this distinction of necessary and contingent truths, he will not be able to go along with us in our researches into the foundations of human knowledge; nor, indeed, to pursue with success any speculation on the subject."†

In the following passage, we are told what the distinction is, the non-recognition of which incurs this denunciation. "Necessary truths are those in which we not only learn that the proposition *is* true, but see that it *must be* true; in which the negation of the truth is not only false, but impossible; in which we cannot, even by an effort of imagination, or in a supposition, conceive the reverse of that which is asserted. That there are such truths cannot be doubted. We may take, for example, all relations of number. Three and Two, added together, make Five. We cannot conceive it to be otherwise. We cannot, by any freak of thought, imagine Three and Two to make Seven."‡

Although Dr. Whewell has naturally and properly employed a variety of phrases to bring his meaning more forcibly home, he

* *Phil. Ind. Sc.* i. 59-61.

† *Ibid.* 57.

‡ *Ibid.* 54, 55.

will, I presume, allow that they are all equivalent; and that what he means by a necessary truth, would be sufficiently defined, a proposition the negation of which is not only false but inconceivable. I am unable to find in any of his expressions, turn them what way you will, a meaning beyond this, and I do not believe he would contend that they mean anything more.

This, therefore, is the principle asserted: that propositions, the negation of which is inconceivable, or in other words, which we cannot figure to ourselves as being false, must rest on evidence of a higher and more cogent description than any which experience can afford. And we have next to consider whether there is any ground for this assertion.

Now I cannot but wonder that so much stress should be laid on the circumstance of inconceivableness, when there is such ample experience to show, that our capacity or incapacity of conceiving a thing has very little to do with the possibility of the thing in itself; but is in truth very much an affair of accident, and depends on the past history and habits of our own minds. There is no more generally acknowledged fact in human nature, than the extreme difficulty at first felt in conceiving anything as possible, which is in contradiction to long established and familiar experience; or even to old familiar habits of thought. And this difficulty is a necessary result of the fundamental laws of the human mind. When we have often seen and thought of two things together, and have never in any one instance either seen or thought of them separately, there is by the primary law of association an increasing difficulty, which may in the end become insuperable, of conceiving the two things apart. This is most of all conspicuous in uneducated persons, who are in general utterly unable to separate any two ideas which have once become firmly associated in their minds; and if persons of cultivated intellect have any advantage on the point, it is only because, having seen and heard and read more, and being more accustomed to exercise their imagination, they have experienced their sensations and thoughts in more varied combinations, and have been prevented from forming many of these inseparable associations. But this advantage has necessarily its limits. The most practised intellect

is not exempt from the universal laws of our concepitive faculty. If daily habit presents to any one for a long period two facts in combination, and if he is not led during that period either by accident or by his voluntary mental operations to think of them apart, he will probably in time become incapable of doing so even by the strongest effort; and the supposition that the two facts can be separated in nature, will at last present itself to his mind with all the characters of an inconceivable phenomenon. There are remarkable instances of this in the history of science: instances in which the most instructed men rejected as impossible, because inconceivable, things which their posterity, by earlier practice and longer perseverance in the attempt, found it quite easy to conceive, and which everybody now knows to be true. There was a time when men of the most cultivated intellects, and the most emancipated from the dominion of early prejudice, could not credit the existence of antipodes; were unable to conceive, in opposition to old association, the force of gravity acting upwards instead of downwards. The Cartesians long rejected the Newtonian doctrine of the gravitation of all bodies towards one another, on the faith of a general proposition, the reverse of which seemed to them to be inconceivable—the proposition that a body cannot act where it is not. All the cumbrous machinery of imaginary vortices, assumed without the smallest particle of evidence, appeared to these philosophers a more rational mode of explaining the heavenly motions, than one which involved what seemed to them so great an absurdity. And they no doubt found it as impossible to conceive that a body should act upon the earth, at the distance of the sun or moon, as we find it to conceive an end to space or time, or two straight lines enclosing a space. Newton himself had not been able to realize the conception, or we should not have had his hypothesis of a subtle ether, the occult cause of gravitation; and his writings prove, that although he deemed the particular nature of the intermediate agency a matter of conjecture, the necessity of *some* such agency appeared to him indubitable. It would seem that even now the majority of scientific men have not completely got over this very difficulty; for though they have at last learnt to conceive the sun *attracting*

the earth without any intervening fluid, they cannot yet conceive the sun illuminating the earth without some such medium.

If, then, it be so natural to the human mind, even in a high state of culture, to be incapable of conceiving, and on that ground to believe impossible, what is afterwards not only found to be conceivable but proved to be true; what wonder if in cases where the association is still older, more confirmed, and more familiar, and in which nothing ever occurs to shake our conviction, or even suggest to us any conception at variance with the association, the acquired incapacity should continue, and be mistaken for a natural incapacity? It is true, our experience of the varieties in nature enables us, within certain limits, to conceive other varieties analogous to them. We can conceive the sun or moon falling; for although we never saw them fall, nor ever perhaps imagined them falling, we have seen so many other things fall, that we have innumerable familiar analogies to assist the conception; which, after all, we should probably have some difficulty in framing, were we not well accustomed to see the sun and moon move, (or appear to move,) so that we are only called upon to conceive a slight change in the direction of motion, a circumstance familiar to our experience. But when experience affords no model on which to shape the new conception, how is it possible for us to form it? How, for example, can we imagine an end to space or time? We never saw any object without something beyond it, nor experienced any feeling without something following it. When, therefore, we attempt to conceive the last point of space, we have the idea irresistably raised of other points beyond it. When we try to imagine the last instant of time, we cannot help conceiving another instant after it. Nor is there any necessity to assume, as is done by a modern school of metaphysicians, a peculiar fundamental law of the mind to account for the feeling of infinity inherent in our conceptions of space and time; that apparent infinity is sufficiently accounted for by simpler and universally acknowledged laws.

Now, in the case of a geometrical axiom, such, for example, as that two straight lines cannot inclose a space,—a truth which is testified to us by our very earliest impressions of the external

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world,—how is it possible (whether those external impressions be or be not the ground of our belief) that the reverse of the proposition *could* be otherwise than inconceivable to us? What analogy have we, what similar order of facts in any other branch of our experience, to facilitate to us the conception of two straight lines inclosing a space? Nor is even this all. I have already called attention to the peculiar property of our impressions of form, that the ideas or mental images exactly resemble their prototypes, and adequately represent them for the purposes of scientific observation. From this, and from the intuitive character of the observation, which in this case reduces itself to simple inspection, we cannot so much as call up in our imagination two straight lines, in order to attempt to conceive them inclosing a space, without by that very act repeating the scientific experiment which establishes the contrary. Will it really be contended that the inconceivableness of the thing, in such circumstances, proves anything against the experimental origin of the conviction? Is it not clear that in whichever mode our belief in the proposition may have originated, the impossibility of our conceiving the negative of it must, on either hypothesis, be the same? As, then, Dr. Whewell exhorts those who have any difficulty in recognising the distinction held by him between necessary and contingent truths, to study geometry,—a condition which I can assure him I have conscientiously fulfilled,—I, in return, with equal confidence, exhort those who agree with him, to study the elementary laws of association; being convinced that nothing more is requisite than a moderate familiarity with those laws, to dispel the illusion which ascribes a peculiar necessity to our earliest inductions from experience, and measures the possibility of things in themselves, by the human capacity of conceiving them.

I hope to be pardoned for adding, that Dr. Whewell himself has both confirmed by his testimony the effect of habitual association in giving to an experimental truth the appearance of a necessary one, and afforded a striking instance of that remarkable law in his own person. In his *Philosophy of the Inductive Sciences* he continually asserts, that propositions which not only

are not self-evident, but which we know to have been discovered gradually, and by great efforts of genius and patience, have, when once established, appeared so self-evident that, but for historical proof, it would have been impossible to conceive that they had not been recognised from the first by all persons in a sound state of their faculties. "We now despise those who, in the Copernican controversy, could not conceive the apparent motion of the sun on the heliocentric hypothesis; or those who, in opposition to Galileo, thought that a uniform force might be that which generated a velocity proportional to the space; or those who held there was something absurd in Newton's doctrine of the different refrangibility of differently coloured rays; or those who imagined that when elements combine, their sensible qualities must be manifest in the compound; or those who were reluctant to give up the distinction of vegetables into herbs, shrubs, and trees. We cannot help thinking that men must have been singularly dull of comprehension to find a difficulty in admitting what is to us so plain and simple. We have a latent persuasion that we in their place should have been wiser and more clear-sighted; that we should have taken the right side, and given our assent at once to the truth. Yet in reality such a persuasion is a mere delusion. The persons who, in such instances as the above, were on the losing side, were very far in most cases from being persons more prejudiced, or stupid, or narrow-minded, than the greater part of mankind now are: and the cause for which they fought was far from being a manifestly bad one, till it had been so decided by the result of the war..... So complete has been the victory of truth in most of these instances, that at present we can hardly imagine the struggle to have been necessary. *The very essence of these triumphs is, that they lead us to regard the views we reject as not only false but inconceivable.*"*

This last proposition is precisely what I contend for; and I ask no more, in order to overthrow the whole theory of its author on the nature of the evidence of axioms. For what is that theory? That the truth of axioms cannot have been learnt from experience,

* *Phil. Ind. Sc.* ii. 174.

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because their falsity is inconceivable. But Dr. Whewell himself says, that we are continually led by the natural progress of thought, to regard as inconceivable what our forefathers not only conceived but believed, nay even (he might have added) were unable to conceive the contrary of. He cannot intend to justify this mode of thought: he cannot mean to say, that we can be *right* in regarding as inconceivable what others have conceived, and as self-evident what to others did not appear evident at all. After so complete an admission that inconceivableness is an accidental thing, not inherent in the phenomenon itself, but dependent on the mental history of the person who tries to conceive it, how can he ever call upon us to reject a proposition as impossible on no other ground than its inconceivableness? Yet he not only does so, but has unintentionally afforded some of the most remarkable examples which can be cited of the very illusion which he has himself so clearly pointed out. I select as specimens, his remarks on the evidence of the three laws of motion, and of the atomic theory.

With respect to the laws of motion, Dr. Whewell says: "No one can doubt that, in historical fact, these laws were collected from experience. That such is the case, is no matter of conjecture. We know the time, the persons, the circumstances, belonging to each step of each discovery." * After this testimony, to adduce evidence of the fact would be superfluous. And not only were these laws by no means intuitively evident, but some of them were originally paradoxes. The first law was especially so. That a body, once in motion, would continue for ever to move in the same direction with undiminished velocity unless acted upon by some new force, was a proposition which mankind found for a long time the greatest difficulty in crediting. It stood opposed to apparent experience of the most familiar kind, which taught that it was the nature of motion to abate gradually, and at last terminate of itself. Yet when once the contrary doctrine was firmly established, mathematicians, as Dr. Whewell observes, speedily began to believe that laws, thus contradictory to first

* *Phil. Ind. Sc.* i. 288.

appearances, and which, even after full proof had been obtained, it had required generations to render familiar to the minds of the scientific world, were under "a demonstrable necessity, compelling them to be such as they are and no other;" and he himself, though not venturing "absolutely to pronounce" that *all* these laws "can be rigorously traced to an absolute necessity in the nature of things," * does actually think in that manner of the law just mentioned; of which he says: "Though the discovery of the first law of motion was made, historically speaking, by means of experiment, we have now attained a point of view in which we see that it might have been certainly known to be true, independently of experience." † Can there be a more striking exemplification than is here afforded, of the effect of association which we have described? Philosophers, for generations, have the most extraordinary difficulty in putting certain ideas together; they at last succeed in doing so; and after a sufficient repetition of the process, they first fancy a natural bond between the ideas, then experience a growing difficulty, which at last, by the continuation of the same progress, becomes an impossibility, of severing them from one another. If such be the progress of an experimental conviction of which the date is of yesterday, and which is in opposition to first appearances, how must it fare with those which are conformable to appearances familiar from the first dawn of intelligence, and of the conclusiveness of which, from the earliest records of human thought, no sceptic has suggested even a momentary doubt?

The other instance which I shall quote is a truly astonishing one, and may be called the *reductio ad absurdum* of the theory of inconceivableness. Speaking of the laws of chemical composition, Dr. Whewell says: ‡ "That they could never have been clearly understood, and therefore never firmly established, without laborious and exact experiments, is certain; but yet we may venture to say, that being once known, they possess an evidence beyond that of mere experiment. *For how, in fact, can we conceive combinations, otherwise than as definite in kind and quality?*

* *Phil. Ind. Sc.* i. 287. † *Ibid.* 218. ‡ *Ibid.* 384, 385.

If we were to suppose each element ready to combine with any other indifferently, and indifferently in any quantity, we should have a world in which all would be confusion and indefiniteness. There would be no fixed kind of bodies; salts, and stones, and ores, would approach to and graduate into each other by insensible degrees. Instead of this, we know that the world consists of bodies distinguishable from each other by definite differences, capable of being classified and named, and of having general propositions asserted concerning them. And as *we cannot conceive a world in which this should not be the case*, it would appear that we cannot conceive a state of things in which the laws of the combination of elements should not be of that definite and measured kind which we have above asserted.

That a philosopher of Dr. Whewell's eminence should gravely assert that we cannot conceive a world in which the simple elements would combine in other than definite proportions; that by dint of meditating on a scientific truth, the original discoverer of which was still living, he should have rendered the association in his own mind between the idea of combination and that of constant proportions so familiar and intimate as to be unable to conceive the one fact without the other; is so signal an instance of the mental law for which I am contending, that one word more in illustration must be superfluous.

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CHAPTER VI.

THE SAME SUBJECT CONTINUED.

§ 1. In the examination which formed the subject of the last chapter, into the nature of the evidence of those deductive sciences which are commonly represented to be systems of necessary truth, we have been led to the following conclusions. The results of those sciences are indeed necessary, in the sense of necessarily following from certain first principles, commonly called axioms and definitions; of being certainly true if those axioms and definitions are so. But their claim to the character of necessity in any sense beyond this, as implying an evidence independent of and superior to observation and experience, must depend on the previous establishment of such a claim in favour of the definitions and axioms themselves. With regard to axioms, we found that, considered as experimental truths, they rest on superabundant and obvious evidence. We inquired, whether, since this is the case, it be necessary to suppose any other evidence of those truths than experimental evidence, any other origin for our belief of them than an experimental origin. We decided, that the burden of proof lies with those who maintain the affirmative, and we examined, at considerable length, such arguments as they have produced. The examination having led to the rejection of those arguments, we have thought ourselves warranted in concluding that axioms are but a class, the highest class, of inductions from experience; the simplest and easiest cases of generalization from the facts furnished to us by our senses or by our internal consciousness.

While the axioms of demonstrative sciences thus appeared to be experimental truths, the definitions, as they are incorrectly called, in those sciences, were found by us to be generalizations from experience which are not even, accurately speaking, truths; being propositions in which, while we assert of some kind of object, some property or properties which observation shows to belong to it, we at the same time deny that it possesses any other

properties, although in truth other properties do in every individual instance accompany, and in almost all instances modify, the property thus exclusively predicated. The denial, therefore, is a mere fiction, or supposition, made for the purpose of excluding the consideration of those modifying circumstances, when their influence is of too trifling amount to be worth considering, or adjourning it, when important, to a more convenient moment.

From these considerations it would appear that Deductive or Demonstrative Sciences are all, without exception, Inductive Sciences; that their evidence is that of experience; but that they are also, in virtue of the peculiar character of one indispensable portion of the general formulae according to which their inductions are made, Hypothetical Sciences. Their conclusions are only true on certain suppositions, which are, or ought to be, approximations to the truth, but are seldom, if ever, exactly true; and to this hypothetical character is to be ascribed the peculiar certainty, which is supposed to be inherent in demonstration.

What we have now asserted, however, cannot be received as universally true of Deductive or Demonstrative Sciences, until verified by being applied to the most remarkable of all those sciences, that of Numbers; the theory of the Calculus; Arithmetic and Algebra. It is harder to believe of the doctrines of this science than of any other, either that they are not truths *a priori*, but experimental truths, or that their peculiar certainty is owing to their being not absolute but only conditional truths. This, therefore, is a case which merits examination apart; and the more so, because on this subject we have a double set of doctrines to contend with; that of the *a priori* philosophers on one side; and on the other, a theory the most opposite to theirs, which was at one time very generally received, and is still far from being altogether exploded among metaphysicians.

§ 2. This theory attempts to solve the difficulty apparently inherent in the case, by representing the propositions of the science of numbers as merely verbal, and its processes as simple transformations of language, substitutions of one expression for another. The proposition, Two and one are equal to three, according to these writers, is not a truth, is not the assertion of a really existing fact, but a definition of the word three; a statement that

mankind have agreed to use the name three as a sign exactly equivalent to two and one; to call by the former name whatever is called by the other more clumsy phrase. According to this doctrine, the longest process in algebra is but a succession of changes in terminology, by which equivalent expressions are substituted one for another; a series of translations of the same fact, from one into another language; though how, after such a series of translations, the fact itself comes out changed, (as when we demonstrate a new geometrical theorem by algebra,) they have not explained; and it is a difficulty which is fatal to their theory.

It must be acknowledged that there are peculiarities in the processes of arithmetic and algebra which render the theory in question very plausible, and have not unnaturally made those sciences the stronghold of Nominalism. The doctrine that we can discover facts, detect the hidden processes of nature, by an artful manipulation of language, is so contrary to common sense, that a person must have made some advances in philosophy to believe it; men fly to so paradoxical a belief to avoid, as they think, some even greater difficulty, which the vulgar do not see. What has led many to believe that reasoning is a mere verbal process, is, that no other theory seemed reconcilable with the nature of the Science of Numbers. For we do not carry any ideas along with us when we use the symbols of arithmetic or of algebra. In a geometrical demonstration we have a mental diagram, if not one on paper; AB, AC are present to our imagination as lines, intersecting other lines, forming an angle with one another, and the like; but not so *a* and *b*. These may represent lines or any other magnitudes, but those magnitudes are never thought of; nothing is realized in our imagination but *a* and *b*. The ideas which, on the particular occasion, they happen to represent, are banished from the mind during every intermediate part of the process, between the beginning, when the premisses are translated from things into signs, and the end, when the conclusion is translated back from signs into things. Nothing, then, being in the reasoner's mind but the symbols, what can seem more inadmissible than to contend that the reasoning process has to do with anything more? We seem to have come to one of Bacon's Prerogative Instances; an *experi-
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Nevertheless, it will appear on consideration, that this apparently so decisive instance is no instance at all; that there is in every step of an arithmetical or algebraical calculation a real induction, a real inference of facts from facts; and that what disguises the induction is simply its comprehensive nature, and the consequent extreme generality of the language. All numbers must be numbers of something: there are no such things as numbers in the abstract. *Ten* must mean ten bodies, or ten sounds, or ten beatings of the pulse. But though numbers must be numbers of something, they may be numbers of anything. Propositions, therefore, concerning numbers, have the remarkable peculiarity that they are propositions concerning all things whatever; all objects, all existences of every kind, known to our experience. All things possess quantity; consist of parts which can be numbered; and in that character possess all the properties which are called properties of numbers. That half of four is two, must be true whatever the word four represents, whether four men, four miles, or four pounds weight. We need only conceive a thing divided into four equal parts, (and all things may be conceived as so divided,) to be able to predicate of it every property of the number four, that is, every arithmetical proposition in which the number four stands on one side of the equation. Algebra extends the generalization still farther: every number represents that particular number of all things without distinction, but every algebraical symbol does more, it represents all numbers without distinction. As soon as we conceive a thing divided into equal parts, without knowing into what number of parts, we may call it *a* or *x*, and apply to it, without danger of error, every algebraical formula in the books. The proposition, $2(a + b) = 2a + 2b$, is a truth coextensive with all nature. Since then algebraical truths are true of all things whatever, and not, like those of geometry, true of lines only or angles only, it is no wonder that the symbols should not excite in our minds ideas of any things in particular. When we demonstrate the forty-seventh proposition of Euclid, it is not necessary that the words should raise in us an image of all right-angled triangles, but only of some one right-angled triangle: so in algebra we need not, under

the symbol a , picture to ourselves all things whatever, but only some one thing; why not, then, the letter itself? The mere written characters, a , b , x , y , z , serve as well for representatives of Things in general, as any more complex and apparently more concrete conception. That we are conscious of them however in their character of things, and not of mere signs, is evident from the fact that our whole process of reasoning is carried on by predicing of them the properties of things. In resolving an algebraic equation, by what rules do we proceed? By applying at each step to a , b , and x , the proposition that equals added to equals make equals; that equals taken from equals leave equals; and other propositions founded on these two. These are not properties of language, or of signs as such, but of magnitudes, which is as much as to say, of all things. The inferences, therefore, which are successively drawn, are inferences concerning Things, not symbols; although as any Things whatever will serve the turn, there is no necessity for keeping the idea of the Thing at all distinct, and consequently the process of thought may, in this case, be allowed without danger to do what all processes of thought, when they have been performed often, will do if permitted, namely, to become entirely mechanical. Hence the general language of algebra comes to be used familiarly without exciting ideas, as all other general language is prone to do from mere habit, though in no other case than this can it be done with complete safety. But when we look back to see from whence the probative force of the process is derived, we find that at every single step, unless we suppose ourselves to be thinking and talking of the things, and not the mere symbols, the evidence fails.

There is another circumstance, which, still more than that which we have now mentioned, gives plausibility to the notion that the propositions of arithmetic and algebra are merely verbal. This is, that when considered as propositions respecting Things, they all have the appearance of being identical propositions. The assertion, Two and one are equal to three, considered as an assertion respecting objects, as for instance "Two pebbles and one pebble are equal to three pebbles," does not affirm equality between two collections of pebbles, but absolute identity. It

affirms that if we put one pebble to two pebbles, those very pebbles are three. The objects, therefore, being the very same, and the mere assertion that "objects are themselves" being insignificant, it seems but natural to consider the proposition, Two and one are equal to three, as asserting mere identity of signification between the two names.

This, however, though it looks so plausible, will not bear examination. The expression "two pebbles and one pebble," and the expression "three pebbles," stand indeed for the same aggregation of objects, but they by no means stand for the same physical fact. They are names of the same objects, but of those objects in two different states: though they denote the same things, their connotation is different. Three pebbles in two separate parcels, and three pebbles in one parcel, do not make the same impression on our senses: and the assertion that the very same pebbles may by an alteration of place and arrangement be made to produce either the one set of sensations or the other, though a very familiar proposition, is not an identical one. It is a truth known to us by early and constant experience: an inductive truth; and such truths are the foundation of the science of Number. The fundamental truths of that science all rest on the evidence of sense; they are proved by showing to our eyes and our fingers that any given number of objects, ten balls for example, may by separation and re-arrangement exhibit to our senses all the different sets of numbers the sum of which is equal to ten. All the improved methods of teaching arithmetic to children proceed on a knowledge of this fact. All who wish to carry the child's *mind* along with them in learning arithmetic; all who wish to teach numbers, and not mere ciphers—now teach it through the evidence of the senses, in the manner we have described.

We may, if we please, call the proposition "Three is two and one," a definition of the number three, and assert that arithmetic, as it has been asserted that geometry, is a science founded on definitions. But they are definitions in the geometrical sense, not the logical; asserting not the meaning of a term only, but along with it an observed matter of fact. The proposition, "A circle is a figure bounded by a line which has all its points equally

distant from a point within it," is called the definition of a circle; but the proposition from which so many consequences follow, and which is really a first principle in geometry, is, that figures answering to this description exist. And thus we may call, "Three is two and one," a definition of three; but the calculations which depend on that proposition do not follow from the definition itself, but from an arithmetical theorem presupposed in it, namely, that collections of objects exist, which, while they impress the senses thus, $\circ\circ\circ$, may be separated into two parts, thus, $\circ\circ$. This proposition being granted, we term all such parcels Threes, after which the enunciation of the above-mentioned physical fact will serve also for a definition of the word Three.

The Science of Number is thus no exception to the conclusion we previously arrived at, that the processes even of deductive sciences are altogether inductive, and that their first principles are generalizations from experience. It remains to be examined whether this science resembles geometry in the further circumstance, that some of its inductions are not exactly true; and that the peculiar certainty ascribed to it, on account of which its propositions are called Necessary Truths, is fictitious and hypothetical, being true in no other sense than that those propositions necessarily follow from the hypothesis of the truth of premisses which are avowedly mere approximations to truth.

§ 8. The inductions of arithmetic are of two sorts: first, those which we have just expounded, such as One and one are two, Two and one are three, &c., which may be called the definitions of the various numbers, in the improper or geometrical sense of the word Definition; and secondly, the two following axioms; The sums of equals are equal, The differences of equals are equal. These two are sufficient; for the corresponding propositions respecting unequals may be proved from these, by *a reductio ad absurdum*.

These axioms, and likewise the so-called definitions, are, as already shown, results of induction; true of all objects whatever, and, as it may seem, exactly true, without the hypothetical assumption of unqualified truth where an approximation to it is all

that exists. The conclusions, therefore, it will naturally be inferred, are exactly true, and the science of number is an exception to other demonstrative sciences in this, that the absolute certainty which is predicable of its demonstrations is independent of all hypothesis.

On more accurate investigation, however, it will be found that, even in this case, there is one hypothetical element in the rationcination. In all propositions concerning numbers, a condition is implied, without which none of them would be true; and that condition is an assumption which may be false. The condition is, that $1=1$; that all the numbers are numbers of the same or of equal units. Let this be doubtful, and not one of the propositions of arithmetic will hold true. How can we know that one pound and one pound make two pounds, if one of the pounds may be troy, and the other avoirdupois? They may not make two pounds of either, or of any weight. How can we know that a forty-horse power is always equal to itself, unless we assume that all horses are of equal strength? It is certain that 1 is always equal in *number* to 1; and where the mere number of objects, or of the parts of an object, without supposing them to be equivalent in any other respect, is all that is material, the conclusions of arithmetic, so far as they go to that alone, are true without mixture of hypothesis. There are a few such cases: as, for instance, an inquiry into the amount of the population of any country. It is indifferent to that inquiry whether they are grown people or children, strong or weak, tall or short; the only thing we want to ascertain is their number. But whenever, from equality or inequality of number, equality or inequality in any other respect is to be inferred, arithmetic carried into such inquiries becomes as hypothetical a science as geometry. All units must be assumed to be equal in that other respect; and this is never practically true, for one actual pound weight is not exactly equal to another, nor one mile's length to another; a nicer balance, or more accurate measuring instruments, would always detect some difference.

What is commonly called mathematical certainty, therefore, which comprises the twofold conception of unconditional truth and perfect accuracy, is not an attribute of all mathematical

truths, but of those only which relate to pure Number, as distinguished from Quantity in the more enlarged sense; and only so long as we abstain from supposing that the numbers are a precise index to actual quantities. The certainty usually ascribed to the conclusions of geometry, and even to those of mechanics, is nothing whatever but certainty of inference. We can have full assurance of particular results under particular suppositions, but we cannot have the same assurance that these suppositions are accurately true, nor that they include all the data which may exercise an influence over the result in any given instance.

§ 4. It appears, therefore, that the method of all Deductive Sciences is hypothetical. They proceed by tracing the consequences of certain assumptions; leaving for separate consideration whether the assumptions are true or not, and if not exactly true, whether they are a sufficiently near approximation to the truth. The reason is obvious. Since it is only in questions of pure number that the assumptions are exactly true, and even there, only so long as no conclusions except purely numerical ones are to be founded on them; it must, in all other cases of deductive investigation, form part of the inquiry, to determine how much the assumptions want of being exactly true in the case in hand. This is generally a matter of observation, to be repeated in every fresh case; or if it has to be settled by argument instead of observation, may require in every different case different evidence, and present every degree of difficulty from the lowest to the highest. But the other part of the process—viz., to determine what else may be concluded if we find, and in proportion as we find, the assumptions to be true—may be performed once for all, and the results held ready to be employed as the occasions turn up for use. We thus do all beforehand that can be so done, and leave the least possible work to be performed when cases arise and press for a decision. This inquiry into the inferences which can be drawn from assumptions, is what properly constitutes Demonstrative Science.

It is of course quite as practicable to arrive at new conclusions from facts assumed, as from facts observed; from fictitious, as from real, inductions. Deduction, as we have seen, consists of a

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series of inferences in this form—*a* is a mark of *b*, *b* of *c*, *c* of *d*, therefore *a* is a mark of *d*, which last may be a truth inaccessible to direct observation. In like manner it is allowable to say, *Suppose* that *a* were a mark of *b*, *b* of *c*, and *c* of *d*, *a* would be a mark of *d*, which last conclusion was not thought of by those who laid down the premisses. A system of propositions as complicated as geometry might be deduced from assumptions which are false; as was done by Ptolemy, Descartes, and others, in their attempts to explain synthetically the phenomena of the solar system on the supposition that the apparent motions of the heavenly bodies were the real motions, or were produced in some way more or less different from the true one. Sometimes the same thing is knowingly done, for the purpose of showing the falsity of the assumption; which is called a *reductio ad absurdum*. In such cases, the reasoning is as follows: *a* is a mark of *b*, and *b* of *c*; now if *c* were also a mark of *d*, *a* would be a mark of *d*; but *d* is known to be a mark of the absence of *a*; consequently *a* would be a mark of its own absence, which is a contradiction; therefore *c* is not a mark of *d*.

§ 5. It has even been held by some writers, that all ratiocination rests in the last resort on a *reductio ad absurdum*; since the way to enforce assent to it, in case of obscurity, would be to show that if the conclusion be denied we must deny some one at least of the premisses, which, as they are all supposed true, would be a contradiction. And in accordance with this, many have thought the peculiar nature of the evidence of ratiocination consisted in the impossibility of admitting the premisses and rejecting the conclusion without a contradiction in terms. This theory, however, is inadmissible as an explanation of the grounds on which ratiocination itself rests. If any one denies the conclusion notwithstanding his admission of the premisses, he is not involved in any direct and express contradiction until he is compelled to deny some premiss; and he can only be forced to do this by a *reductio ad absurdum*, that is, by another ratiocination: now, if he denies the validity of the reasoning process itself, he can no more be forced to assent to the second syllogism than to the first. In truth, therefore, no one is ever forced to a contradiction in terms:

he can only be forced to a contradiction (or rather an infringement) of the fundamental maxim of ratiocination, namely, that whatever has a mark, has what it is a mark of; or, (in the case of universal propositions,) that whatever is a mark of anything, is a mark of whatever else that thing is a mark of. For in the case of every correct argument, as soon as thrown into the syllogistic form, it is evident without the aid of any other syllogism, that he who, admitting the premisses, fails to draw the conclusion, does not conform to the above axiom.

Without attaching exaggerated importance to the distinction now drawn, I think it enables us to characterize in a more accurate manner than is usually done, the nature of demonstrative evidence and of logical necessity. That is necessary, from which to withhold assent would be to violate the above axiom. And since the axiom can only be violated by assenting to premisses and rejecting a legitimate conclusion from them, nothing is necessary, except the connexion between a conclusion and premisses; of which doctrine, the whole of this and the preceding chapter are submitted as the proof.

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EXAMINATION OF HAMILTON.

CHAPTER VI.

THE PHILOSOPHY OF THE CONDITIONED.

We cannot conclude anything to be impossible, because its possibility is inconceivable to us; for two reasons. First, what seems to us inconceivable, and, so far as we are personally concerned, may really be so, usually owes its inconceivability only to a strong association. When, in a prolonged experience, we have often had a particular sensation or mental impression, and never without a certain other sensation or impression immediately accompanying it, there grows up so firm an adhesion between our ideas of the two, that we are unable to think of the former without thinking the latter in close combination with it. And unless other parts of our experience afford us some analogy to aid in disentangling the two ideas, our incapacity of imagining the one fact without the other grows, or is prone to grow, into a belief that the one cannot exist without the other. This is the law of Inseparable Association, an element of our nature of which few have realized to themselves the full power. It was for the first time largely applied to the explanation of the more complicated mental phænomena by Mr. James Mill; and is, in an especial manner, the key to the phænomenon of inconceivability. As that phænomenon only exists because our powers of conception are determined by our limited experience, Inconceivables are incessantly becoming Conceivables as our experience becomes enlarged. There is no need to go farther for an example than the case of Antipodes. This physical fact was, to the early speculators, inconceivable: not, of course, the fact of persons in that position; this the mind could easily represent to itself; but the possibility that being in that position, and not being nailed on, nor having any glutinous substance attached to their feet, they could help falling off. Here was an inseparable, though, as it proved to be, not an indissoluble association, which while it con-

tinued made a real fact what is called inconceivable; and because inconceivable, it was unhesitatingly believed to be impossible. Inconceivabilities of similar character have, at many periods, obstructed the reception of new scientific truths: the Newtonian system had to contend against several of them; and we are not warranted in assigning a different origin and character to those which still subsist, because the experience that would be capable of removing them has not occurred. If anything which is now inconceivable by us were shown to us as a fact, we should soon find ourselves able to conceive it. We should even be in danger of going over to the opposite error, and believing that the negation of it is inconceivable. There are many cases in the history of science (I have dilated on some of them in another work) where something which had once been inconceivable, and which people had with great difficulty learnt to conceive, becoming itself fixed in the bonds of an inseparable association, scientific men came to think that it alone was conceivable, and that the conflicting hypothesis which all mankind had believed, and which a vast majority were probably believing still, was inconceivable. In Dr. Whewell's writings on the Inductive Sciences, this transition of thought is not only exemplified, but defended. Inconceivability is thus a purely subjective thing, arising from the mental antecedents of the individual mind, or from those of the human mind generally at a particular period, and cannot give us any insight into the possibilities of Nature.

But secondly, were it granted that inconceivability is not solely the consequence of limited experience, but that some incapacities of conceiving are inherent in the mind, and inseparable from it, this would not entitle us to infer that what we are thus incapable of conceiving, cannot exist. Such an inference would only be warrantable, if we could know *a priori* that we must have been created capable of conceiving whatever is capable of existing; that the universe of thought and that of reality, the Microcosm and the Macrocosm (as they once were called) must have been framed in complete correspondence with one another. That this is really the case has been laid down expressly in some systems of philosophy, by implication in more, and is the foundation

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(among others) of the systems of Schelling and Hegel: but an assumption more destitute of evidence could scarcely be made, nor can one easily imagine any evidence that could prove it, unless it were revealed from above.

What is inconceivable, then, cannot therefore be inferred to be false. But let us vary the terms of the proposition, and express it thus: what is inconceivable, is not therefore incredible. We have now a statement, which may mean either exactly the same as the other, or more. It may mean only that our inability to conceive a thing, does not entitle us to deny its possibility, nor its existence. Or it may mean, that a thing's being inconceivable to us is no reason against our believing, and legitimately believing, that it actually is. This is a very different proposition from the preceding. Sir W. Hamilton, as we have said, goes this length. It is now necessary to enter more minutely than at first seemed needful, into the meaning of "inconceivable;" which, like almost all the metaphysical terms we are forced to make use of, is weighed down with ambiguities.

The first meaning of Inconceivable is, that of which the mind cannot form to itself any representation: either (as in the case of Noumena) because no attributes are given out of which a representation could be framed, or because the attributes given are incompatible with one another—are such as the mind cannot put together in a single image. Of this last case numerous instances present themselves to the most cursory glance. The fundamental one is that of a simple contradiction. We cannot represent anything to ourselves as at once being something, and not being it; as at once having, and not having, a given attribute. The following are other examples. We cannot represent to ourselves time or space as having an end. We cannot represent to ourselves two and two as making five; nor two straight lines as enclosing a space. We cannot represent to ourselves a round square; or a body all black, and at the same time all white.

These things are literally inconceivable to us, our minds and our experience being what they are. Whether they would be inconceivable if our minds were the same but our experience different, is open to discussion. A distinction may be made, which, I

think, will be found pertinent to the question. That the same thing should at once be and not be—that identically the same statement should be both true and false—is not only inconceivable to us, but we cannot conceive that it could be made conceivable. We cannot attach sufficient meaning to the proposition, to be able to represent to ourselves the supposition of a different experience on this matter. We cannot therefore even entertain the question, whether the incompatibility is in the original structure of our minds, or is only put there by our experience. The case is otherwise in all the other examples of inconceivability. Our incapacity of conceiving the same thing as A and not A, may be primordial; but our inability to conceive A without B, is because A, by experience or teaching, has become inseparably associated with B: and our inability to conceive A with C, is, because, by experience or teaching, A has become inseparably associated with some mental representation which includes the negation of C. Thus all inconceivabilities may be reduced to inseparable association, combined with the original inconceivability of a direct contradiction. All the cases which I have cited as instances of inconceivability, and which are the strongest I could have chosen, may be resolved in this manner. We cannot conceive a round square, not merely because no such object has ever presented itself in our experience, for that would not be enough. Neither, for anything we know, are the two ideas in themselves incompatible. To conceive a round square, or to conceive a body all black and yet all white, would only be to conceive two different sensations as produced in us simultaneously by the same object; a conception familiar to our experience; and we should probably be as well able to conceive a round square as a hard square, or a heavy square, if it were not that, in our uniform experience, at the instant when a thing begins to be round it ceases to be square, so that the beginning of the one impression is inseparably associated with the departure or cessation of the other. Thus our inability to form a conception always arises from our being compelled to form another contradictory to it. We cannot conceive time or space as having an end, because the idea of any portion whatever of time or space is inseparably associated with the idea

of a time or space beyond it. We cannot conceive two and two as five, because an inseparable association compels us to conceive it as four; and it cannot be conceived as both, because four and five, like round and square, are so related in our experience, that each is associated with the cessation, or removal, of the other. We cannot conceive two straight lines as enclosing a space, because inclosing a space means approaching and meeting a second time; and the mental image of two straight lines which have once met, is inseparably associated with the representation of them as diverging. Thus it is not wholly without ground that the notion of a round square, and the assertion that two and two make five, or that two straight lines can enclose a space, are said, in common and even in scientific parlance, to involve a contradiction. The statement is not logically correct, for contradiction is only between a positive representation and its negative. But the impossibility of uniting contradictory conceptions in the same representation, is the real ground of the inconceivability in these cases. And we should probably have no difficulty in putting together the two ideas supposed to be incompatible, if our experience had not first inseparably associated one of them with the contradictory of the other.

LOGIC—BOOK III.

CHAPTER II.

OF INDUCTIONS IMPROPERLY SO CALLED.

§ 1. Induction is that operation of the mind, by which we infer that what we know to be true in a particular case or cases, will be true in all cases which resemble the former in certain assignable respects. In other words, Induction is the process by which we conclude that what is true of certain individuals of a class is true of the whole class, or that what is true at certain times will be true in similar circumstances at all times.

This definition excludes from the meaning of the term Induction, various logical operations, to which it is not unusual to apply that name.

Induction, as above defined, is a process of inference; it proceeds from the known to the unknown; and any operation involving no inference, any process in which what seems the conclusion is no wider than the premisses from which it is drawn, does not fall within the meaning of the term. Yet in the common books of Logic we find this laid down as the most perfect, indeed the only quite perfect, form of induction. In those books, every process which sets out from a less general and terminates in a more general expression,—which admits of being stated in the form, "This and that A are B, therefore every A is B,"—is called an induction, whether anything be really concluded or not; and the induction is asserted to be not perfect, unless every single individual of the class A is included in the antecedent, or premiss: that is, unless what we affirm of the class has already been ascertained to be true of every individual in it, so that the nominal conclusion is not really a conclusion, but a mere reassertion of the premisses. If we were to say, All the planets shine by the sun's light, from observation of each separate planet, or All the Apostles were Jews, because this is true of Peter, Paul, John, and every other apostle,—these, and such as these, would, in the phraseology in question, be called perfect, and the only perfect, Inductions.

This, however, is a totally different kind of induction from ours; it is no inference from facts known to facts unknown, but a mere short-hand registration of the facts known. The two simulated arguments which we have quoted, are not generalizations; the propositions purporting to be conclusions from them, are not really general propositions. A general proposition is one in which the predicate is affirmed or denied of an unlimited number of individuals; namely, all, whether few or many, existing or capable of existing, which possess the properties connoted by the subject of the proposition. "All men are mortal" does not mean all now living, but all men past, present, and to come. When the signification of the term is limited so as to render it a name not for any and every individual falling under a certain general description, but only for each of a number of individuals designated as such, and as it were counted off individually, the proposition, though it may be general in its language, is no general proposition, but merely that number of singular propositions, written in an abridged character. The operation may be very useful, as most forms of abridged notation are; but it is no part of the investigation of truth, though often bearing an important part in the preparation of the materials for that investigation.

§ 2. A second process which requires to be distinguished from Induction, is one to which mathematicians sometimes give that name: and which so far resembles induction properly so called, that the propositions it leads to are really general propositions. For example, when we have proved, with respect to the circle, that a straight line cannot meet it in more than two points, and when the same thing has been successively proved of the ellipse, the parabola, and the hyperbola, it may be laid down as an universal property of the sections of the cone. In this example there is no induction, because there is no inference: the conclusion is a mere summing up of what was asserted in the various propositions from which it is drawn. A case somewhat, though not altogether, similar, is the proof of a geometrical theorem by means of a diagram. Whether the diagram be on paper or only in the imagination, the demonstration (as formerly observed)

does not prove directly the general theorem; it proves only that the conclusion, which the theorem asserts generally, is true of the particular triangle or circle exhibited in the diagram; but since we perceive that in the same way in which we have proved it of that circle, it might also be proved of any other circle, we gather up into one general expression all the singular propositions susceptible of being thus proved, and embody them in a universal proposition. Having shown that the three angles of the triangle A B C are together equal to two right angles, we conclude that this is true of every other triangle, not because it is true of A B C, but for the same reason which proved it to be true of A B C. If this were to be called Induction, an appropriate name for it would be, Induction by parity of reasoning. But the term cannot properly belong to it; the characteristic quality of Induction is wanting, since the truth obtained, though really general, is not believed on the evidence of particular instances. We do not conclude that all triangles have the property because some triangles have, but from the ulterior demonstrative evidence which was the ground of our conviction in the particular instances.

There are nevertheless, in mathematics, some examples of so-called induction, in which the conclusion does bear the appearance of a generalization grounded on some of the particular cases included in it. A mathematician, when he has calculated a sufficient number of the terms of an algebraical or arithmetical series to have ascertained what is called the *law* of the series, does not hesitate to fill up any number of the succeeding terms without repeating the calculations. But I apprehend he only does so when it is apparent from *a priori* considerations (which might be exhibited in the form of demonstration) that the mode of formation of the subsequent terms, each from that which preceded it, must be similar to the formation of the terms which have been already calculated. And when the attempt has been hazarded without the sanction of such general considerations, there are instances on record in which it has led to false results.

It is said that Newton discovered the binomial theorem by induction; by raising a binomial successively to a certain number of powers, and comparing those powers with one another until he

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detected the relation in which the algebraic formula of each power stands to the exponent of that power, and to the two terms of the binomial. The fact is not improbable: but a mathematician like Newton, who seemed to arrive *per saltum* at principles and conclusions that ordinary mathematicians only reached by a succession of steps, certainly could not have performed the comparison in question without being led by it to the *a priori* ground of the law; since any one who understands sufficiently the nature of multiplication to venture upon multiplying several lines of symbols at one operation, cannot but perceive that in raising a binomial to a power, the coefficients must depend on the laws of permutation and combination: and as soon as this is recognized, the theorem is demonstrated. Indeed, when once it was seen that the law prevailed in a few of the lower powers, its identity with the law of permutation would at once suggest the considerations which prove it to obtain universally. Even, therefore, such cases as these, are but examples of what I have called induction by parity of reasoning, that is, not really induction, because not involving inference of a general proposition from particular instances.

§ 3. There remains a third improper use of the term Induction, which it is of real importance to clear up, because the theory of induction has been, in no ordinary degree, confused by it, and because the confusion is exemplified in the most recent and most elaborate treatise on the inductive philosophy which exists in our language. The error in question is that of confounding a mere description of a set of observed phenomena, with an induction from them.

Suppose that a phenomenon consists of parts, and that these parts are only capable of being observed separately, and as it were piecemeal. When the observations have been made, there is a convenience (amounting for many purposes to a necessity) in obtaining a representation of the phenomenon as a whole, by combining, or as we may say, piecing these detached fragments together. A navigator sailing in the midst of the ocean discovers land: he cannot at first, or by any one observation, determine whether it is a continent or an island; but he coasts along it, and after a few days finds himself to have sailed completely round

it: he then pronounces it an island. Now there was no particular time or place of observation at which he could perceive that this land was entirely surrounded by water: he ascertained the fact by a succession of partial observations, and then selected a general expression which summed up in two or three words the whole of what he so observed. But is there anything of the nature of an induction in this process? Did he infer anything that had not been observed, from something else which had? Certainly not. He had observed the whole of what the proposition asserts. That the land in question is an island, is not an inference from the partial facts which the navigator saw in the course of his circumnavigation; it is the facts themselves; it is a summary of those facts; the description of a complex fact, to which those simpler ones are as the parts of a whole.

Now t . . I conceive, no difference in kind between this simple operation, and that by which Kepler ascertained the nature of the planetary orbits: and Kepler's operation, all at least that was characteristic in it, was not more an inductive act than that of our supposed navigator.

The object of Kepler was to determine the real path described by each of the planets, or let us say by the planet Mars, (for it was of that body that he first established two of the three great astronomical truths which bear his name.) To do this there was no other mode than that of direct observation: and all which observation could do was to ascertain a great number of the successive places of the planet; or rather, of its apparent places. That the planet occupied successively all these positions, or at all events, positions which produced the same impressions on the eye, and that it passed from one of these to another insensibly, and without any apparent breach of continuity; thus much the senses, with the aid of the proper instruments, could ascertain. What Kepler did more than this, was to find what sort of a curve these different points would make; supposing them to be all joined together. He expressed the whole series of the observed places of Mars by what Dr. Whewell calls the general conception of an ellipse. This operation was far from being as easy as that of the navigator who expressed the series of his observations on suc-

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To avoid misapprehension, we must remark that Kepler, in one respect, performed a real act of induction; namely, in concluding that because the observed places of Mars were correctly represented by points in an imaginary ellipse, therefore Mars would continue to revolve in that same ellipse; and even in concluding that the position of the planet during the time which intervened between two observations, must have coincided with the intermediate points of the curve. But this really inductive operation requires to be carefully distinguished from the mere act of bringing the facts actually observed under a general description. So distinct are these two operations, that the one might have been performed without the other. Men might and did make correct inductions concerning the heavenly motions, before they had obtained correct general descriptions of them. It was known that the planets always moved in the same paths, long before it had been ascertained that those paths were ellipses. Astronomers early remarked that the same set of apparent positions returned periodically. When they obtained a new description of the phenomenon, they did not necessarily make any further induction, nor (which is the true test of a new general truth) add anything to the power of prediction which they already possessed.

§ 4. The descriptive operation which enables a number of details to be summed up in a single proposition, Dr. Whewell, by an aptly chosen expression, has termed the Colligation of Facts.* In most of his observations concerning that mental process I fully agree, and would gladly transfer all that portion of his book into my own pages. I only think him mistaken in setting up this kind of operation, which according to the old and received meaning of the term, is not induction at all, as the type of induction generally; and laying down, throughout his work, as principles of induction, the principles of mere colligation.

* *Phil. Ind. Sc.* ii. 213, 214.

Dr. Whewell maintains that the general proposition which binds together the particular facts, and makes them, as it were, one fact, is not the mere sum of those facts, but something more, since there is introduced a conception of the mind, which did not exist in the facts themselves. "The particular facts," says he,* "are not merely brought together, but there is a new element added to the combination by the very act of thought by which they are combined. . . . When the Greeks, after long observing the motions of the planets, saw that these motions might be rightly considered as produced by the motion of one wheel revolving in the inside of another wheel, these wheels were creations of their minds, added to the facts which they perceived by sense. And even if the wheels were no longer supposed to be material, but were reduced to mere geometrical spheres or circles, they were not the less products of the mind alone,—something additional to the facts observed. The same is the case in all other discoveries. The facts are known, but they are insulated and unconnected, till the discoverer supplies from his own store a principle of connexion. The pearls are there, but they will not hang together till some one provides the string."

That a conception of the mind is introduced is indeed undeniable, and I willingly concede, that to hit upon the right conception is often a far more difficult and more meritorious achievement, than to prove its applicability when obtained. But a conception implies, and corresponds to, something conceivable: and though the conception itself is not in the facts, but in our mind, it must be a conception of something which really is in the facts, some property which they actually possess, and which they would manifest to our senses, if our senses were able to take cognizance of them. If, for instance, the planet left behind it in space a visible track, and if the observer were in a fixed position at such a distance above the plane of the orbit as would enable him to see the whole of it at once, he would see it to be an ellipse; and if gifted with appropriate instruments, and powers of locomotion, he could prove it to be such by measuring its different dimensions.

* *Phil. Ind. Sc.* ii. 213, 214.

These things are indeed impossible to us, but not impossible in themselves; if they were so, Kepler's law could not be true.

Subject to the indispensable condition which has just been stated, I cannot perceive that the part which conceptions have in the operation of studying facts, has ever been overlooked or undervalued. No one ever disputed that in order to reason about anything we must have a conception of it; or that when we include a multitude of things under a general expression, there is implied in the expression a conception of something common to those things. But it by no means follows that the conception is necessarily pre-existent, or constructed by the mind out of its own materials. If the facts are rightly classed under the conception, it is because there is in the facts themselves something of which the conception is itself a copy; and which if we cannot directly perceive, it is because of the limited power of our organs, and not because the thing itself is not there. The conception itself is often obtained by abstraction from the very facts which, in Dr. Whewell's language, it is afterwards called in to connect. This he himself admits, when he observes (which he does on several occasions) how great a service would be rendered to the science of physiology by the philosopher "who should establish a precise, tenable, and consistent conception of life."* Such a conception can only be abstracted from the phenomena of life itself; from the very facts which it is put in requisition to connect. In other cases (no doubt) instead of collecting the conception from the very phenomena which we are attempting to colligate, we select it from among those which have been previously collected by abstraction from other facts. In the instance of Kepler's laws, the latter was the case. The facts being out of the reach of being observed, in any such manner as would have enabled the senses to identify directly the path of the planet, the conception requisite for framing a general description of that path could not be collected by abstraction from the observations themselves; the mind had to supply hypothetically, from among the conceptions it had obtained from other portions of its experience, some one which

* *Phil. Ind. Sc.* ii. 173.

would correctly represent the series of the observed facts. It had to frame a supposition respecting the general course of the phenomenon, and ask itself, If this be the general description, what what will the details be? and then compare these with the details actually observed. If they agreed, the hypothesis would serve for a description of the phenomenon: if not, it was necessarily abandoned, and another tried. It is such a case as this which gives rise to the doctrine that the mind, in framing the descriptions, adds something of its own which it does not find in the facts.

Yet it is a fact surely, that the planet does describe an ellipse; and a fact which we could see, if we had adequate visual organs and a suitable position. Not having these advantages, but possessing the conception of an ellipse, or (to express the meaning in less technical language) knowing what an ellipse was, Kepler tried whether the observed places of the planet were consistent with such a path. He found they were so; and he, consequently, asserted as a fact that the planet moved in an ellipse. But this fact, which Kepler did not add to, but found in, the motions of the planet, namely, that it occupied in succession the various points in the circumference of a given ellipse, was the very fact, the separate parts of which had been separately observed; it was the sum of the different observations.

Having stated this fundamental difference between my opinion and that of Dr. Whewell, I must add, that his account of the manner in which a conception is selected, suitable to express the facts, appears to me perfectly just. The experience of all thinkers will, I believe, testify that the process is tentative; that it consists of a succession of guesses; many being rejected, until one at last occurs fit to be chosen. We know from Kepler himself that before hitting upon the "conception" of an ellipse, he tried nineteen other imaginary paths, which, finding them inconsistent with the observations, he was obliged to reject. But as Dr. Whewell truly says, the successful hypothesis, though a guess, ought generally to be called, not a lucky, but a skilful guess. The guesses which serve to give mental unity and wholeness to a chaos of scattered particulars, are accidents which rarely occur to any

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How far this tentative method, so indispensable as a means to the colligation of facts for purposes of description, admits of application to Induction itself, and what functions belong to it in that department, will be considered in the chapter of the present Book which relates to Hypotheses. On the present occasion we have chiefly to distinguish this process of Colligation from Induction properly so called: and that the distinction may be made clearer, it is well to advert to a curious and interesting remark, which is as strikingly true of the former operation, as it appears to me unequivocally false of the latter.

In different stages of the progress of knowledge, philosophers have employed, for the colligation of the same order of facts, different conceptions. The early rude observations of the heavenly bodies, in which minute precision was neither attained nor sought, presented nothing inconsistent with the representation of the path of a planet as an exact circle, having the earth for its centre. As observations increased in accuracy, and facts were disclosed which were not reconcileable with this simple supposition; for the colligation of those additional facts, the supposition was varied; and varied again and again as facts became more numerous and precise. The earth was removed from the centre to some other point within the circle; the planet was supposed to revolve in a smaller circle called an epicycle, round an imaginary point which revolved in a circle round the earth: in proportion as observation elicited fresh facts contradictory to these representations, other epicycles and other eccentricities were added, producing additional complication; until at last Kepler swept all these circles away, and substituted the conception of an exact ellipse. Even this is found not to represent with complete correctness the accurate observations of the present day, which disclose many slight deviations from an orbit exactly elliptical. Now Dr. Whewell has remarked that these successive general expressions, though apparently so conflicting, were all correct: they all answered the purpose of colligation: they all enabled the mind to represent to itself with facility, and by a simultaneous glance, the whole body of facts

at that time ascertained; each in its turn served as a correct description of the phenomena, so far as the senses had up to that time taken cognizance of them. If a necessity afterwards arose for discarding one of these general descriptions of the planet's orbit, and framing a different imaginary line, by which to express the series of observed positions, it was because a number of facts had now been added, which it was necessary to compare with the old facts into one general description. But this did not affect the correctness of the former expression, considered as a general statement of the only facts which it was intended to represent. And so true is this, that, as is well remarked by M. Comte, these ancient generalizations, even the rudest and most imperfect of them, that of uniform movement in a circle, are so far from being entirely false, that they are even now habitually employed by astronomers when only a rough approximation to correctness is required. "L'astronomie moderne, en détruisant sans retour les hypothèses primitives, envisagées comme lois réelles du monde, a soigneusement maintenu leur valeur positive et permanente, la propriété de représenter commodément les phénomènes quand il s'agit d'une première ébauche. Nos ressources à cet égard sont même bien plus étendues, précisément à cause que nous ne nous faisons aucune illusion sur la réalité des hypothèses; ce qui nous permet d'employer sans scrupule, en chaque cas, celle que nous jugeons la plus avantageuse."*

Dr. Whewell's remark, therefore, is philosophically correct. Successive expressions for the colligation of observed facts, or, in other words, successive descriptions of a phenomenon as a whole, which has been observed only in parts, may, though conflicting, be all correct as far as they go. But it would surely be absurd to assert this of conflicting inductions.

The scientific study of facts may be undertaken for three different purposes: the simple description of the facts; their explanation; or their prediction: meaning by prediction, the determination of the conditions under which similar facts may be expected again to occur. To the first of these three operations the name

* *Cours de Philosophie Positive*, vol. ii., p. 202.

of Induction does not properly belong: to the other two it does. Now, Dr. Whewell's observation is true of the first alone. Considered as a mere description, the circular theory of the heavenly motions represents perfectly well their general features; and by adding epicycles without limit, those motions, even as now known to us, might be expressed with any degree of accuracy that might be required. The elliptical theory, as a mere description, would have great advantage in point of simplicity, and in the consequent facility of conceiving it and reasoning about it: but it would not really be more true than the other. Different descriptions, therefore, may be all true: but not, surely, different explanations. The doctrine that the heavenly bodies moved by a virtue inherent in their celestial nature; the doctrine that they were moved by impact, (which led to the hypothesis of vortices as the only impelling force capable of whirling bodies in circles,) and the Newtonian doctrine, that they are moved by the composition of a centripetal with an original projectile force; all these are explanations, collected by real induction from supposed parallel cases; and they were all successively received by philosophers, as scientific truths on the subject of the heavenly bodies. Can it be said of these, as was said of the different descriptions, that they are all true as far as they go? Is it not clear that one only can be true in any degree, and the other two must be altogether false? So much for explanations: let us now compare different predictions: the first, that eclipses will occur whenever one planet or satellite is so situated as to cast its shadow upon another; the second, that they will occur whenever some great calamity is impending over mankind. Do these two doctrines only differ in the degree of their truth, as expressing real facts with unequal degrees of accuracy? Assuredly the one is true, and the other absolutely false.

Dr. Whewell, in his reply, contests the distinction here drawn, and maintains, that not only different descriptions, but different explanations of a phenomenon, may all be true. Of the three theories respecting the motions of the heavenly bodies, he says: "Undoubtedly all these explanations may be true and consistent with each other, and would be so if each had been followed out

so as to shew in what manner it could be made consistent with the facts. And this was, in reality, in a great measure done. The doctrine that the heavenly bodies were moved by vortices was successively modified, so that it came to coincide in its results with the doctrine of an inverse quadratic centripetal force When this point was reached, the vortex was merely a machinery, well or ill devised, for producing such a centripetal force, and therefore did not contradict the doctrine of a centripetal force. Newton himself does not appear to have been averse to explaining gravity by impulse. So little is it true that if one theory be true the other must be false. The attempt to explain gravity by the impulse of streams of particles flowing through the universe in all directions, which I have mentioned in the *Philosophy*, is so far from being inconsistent with the Newtonian theory, that it is founded entirely upon it. And even with regard to the doctrine, that the heavenly bodies move by an inherent virtue; if this doctrine had been maintained in any such way that it was brought to agree with the facts, the inherent virtue must have had its laws determined; and then it would have been found that the virtue had a reference to the central body; and so, the 'inherent virtue' must have coincided in its effect with the Newtonian force; and then, the two explanations would agree, except so far as the word 'inherent' was concerned. And if such a part of an earlier theory as this word *inherent* indicates, is found to be untenable, it is of course rejected in the transition to later and more exact theories, in Inductions of this kind, as well as in what Mr. Mill calls Descriptions. There is, therefore, still no validity discoverable in the distinction which Mr. Mill attempts to draw between descriptions like Kepler's law of elliptical orbits, and other examples of induction."

If the doctrine of vortices had meant, not that vortices existed, but only that the planets moved *in the same manner* as if they had been whirled by vortices; if the hypothesis had been merely a mode of representing the facts, not an attempt to account for them; if, in short, it had been only a Description; it would, no doubt, have been reconcileable with the Newtonian theory. The vortices, however, were not a mere aid to conceiving the motions

of the planets, but a supposed physical agent, actively impelling them; a material fact, which might be true or not true, but could not be both true and not true. According to Descartes' theory it was true, according to Newton's it was not true. Dr. Whewell probably means that since the phrases, centripetal and projectile force, do not declare the nature but only the direction of the forces, the Newtonian theory does not absolutely contradict any hypothesis which may be framed respecting the mode of their production. The Newtonian theory, regarded as a mere *description* of the planetary motions, does not; but the Newtonian theory as an *explanation* of them does. For in what does the explanation consist? In ascribing those motions to a general law which obtains between all particles of matter, and in identifying this with the law by which bodies fall to the ground; a kind of motion which the vortices did not, and as it was rectilineal, could not, explain. The one explanation, therefore, absolutely excludes the other. Either the planets are not moved by vortices, or they do not move by the law by which heavy bodies fall. It is impossible that both opinions can be true. As well might it be said that there is no contradiction between the assertions, that a man died because somebody killed him, and that he died a natural death.

So, again, the theory that the planets move by a virtue inherent in their celestial nature, is incompatible with either of the two others; either that of their being moved by vortices, or that which regards them as moving by a property which they have in common with the earth and all terrestrial bodies. Dr. Whewell says, that the theory of an inherent virtue agrees with Newton's when the word *inherent* is left out, which of course it would be (he says) if "found to be untenable." But leave that out, and where is the theory? The word *inherent* *is* the theory. When that is omitted, there remains nothing except that the heavenly bodies move by "a virtue," i. e. by a power of some sort.

If Dr. Whewell is not yet satisfied, any other subject will serve equally well to test his doctrine. He will hardly say that there is no contradiction between the emission theory and the undulatory theory of light; or that there can be both one and two electricities; or that the hypothesis of the production of the higher

organic forms by development from the lower, and the supposition of separate and successive acts of creation, are quite reconcileable; or that the theory that volcanoes are fed from a central fire, and the doctrines which ascribe them to chemical action at a comparatively small depth below the earth's surface, are consistent with one another, and all true as far as they go.

If different explanations of the same fact cannot both be true, still less, surely, can different predictions. Dr. Whewell quarrels (on what ground it is not necessary to consider) with the example I had chosen on this point, and thinks an objection to an illustration a sufficient answer to a theory. Examples not liable to his objection are easily found, if the proposition that conflicting predictions cannot both be true, can be made clearer by any examples. Suppose the phenomenon to be a newly-discovered comet, and that one astronomer predicts its return once in every 300 years—another, once in every 400: can they both be right? When Columbus predicted that by sailing constantly westward he should in time return to the point from which he set out, while others asserted that he could never do so except by turning back, were both he and his opponents true prophets? Were the predictions which foretold the wonders of railways and steamships, and those which averred that the Atlantic could never be crossed by steam navigation, nor a railway train propelled ten miles an hour, both (in Dr. Whewell's words) "true and consistent with one another"?

Dr. Whewell sees no distinction between holding contradictory opinions on a question of fact, and merely employing different analogies to facilitate the conception of the same fact. The case of different Inductions belongs to the former class, that of different Descriptions to the latter.

CHAPTER III.

OF THE GROUND OF INDUCTION.

§ 1. Induction properly so called, as distinguished from those mental operations, sometimes though improperly designated by

the name, which I have attempted in the preceding chapter to characterize, may, then, be summarily defined as Generalization from Experience. It consists in inferring from some individual instances in which a phenomenon is observed to occur, that it occurs in all instances of a certain class: namely, in all which *resemble* the former, in what are regarded as the material circumstances.

In what way the material circumstances are to be distinguished from those which are immaterial, or why some of the circumstances are material and others not so, we are not yet ready to point out. We must first observe, that there is a principle implied in the very statement of what Induction is; an assumption with regard to the course of nature and the order of the universe: namely, that there are such things in nature as parallel cases; that what happens once, will, under a sufficient degree of similarity of circumstances, happen again, and not only again, but as often as the same circumstances recur. This, I say, is an assumption, involved in every case of induction. And, if we consult the actual course of nature, we find that the assumption is warranted. The universe, we find, is so constituted, that whatever is true in any one case, is true in all cases of a certain description; the only difficulty is, to find *what* description.

This universal fact, which is our warrant for all inferences from experience, has been described by different philosophers in different forms of language: that the course of nature is uniform: that the universe is governed by general laws; and the like. One of the most usual of these modes of expression, but also one of the most inadequate, is that which has been brought into familiar use by the metaphysicians of the school of Reid and Stewart. The disposition of the human mind to generalize from experience,—a propensity considered by these philosophers as an instinct of our nature,—they usually describe under some such name as “our intuitive conviction that the future will resemble the past.” Now it has been well pointed out, that (whether the tendency be or not an original and ultimate element of our nature), Time, in its modifications of past, present, and future, has no concern either with the belief itself, or with the grounds of it. We be-

lieve that fire will burn to-morrow, because it burned to-day and yesterday; but we believe, on precisely the same grounds, that it burned before we were born, and that it burns this very day in Cochin-China. It is not from the past to the future, *as* past and future, that we infer, but from the known to the unknown; from facts observed to facts unobserved; from what we have perceived, or been directly conscious of, to what has not come within our experience. In this last predicament is the whole region of the future; but also the vastly greater portion of the present and of the past.

Whatever be the most proper mode of expressing it, the proposition that the course of nature is uniform, is the fundamental principle, or general axiom, of Induction. It would yet be a great error to offer this large generalization as any explanation of the inductive process. On the contrary, I hold it to be itself an instance of induction, and induction by no means of the most obvious kind. Far from being the first induction we make, it is one of the last, or at all events one of those which are latest in attaining strict philosophical accuracy. As a general maxim, indeed, it has scarcely entered into the minds of any but philosophers; nor even by them, as we shall have many opportunities of remarking, have its extent and limits been always very justly conceived. The truth is, that this great generalization is itself founded on prior generalizations. The obscurer laws of nature were discovered by means of it, but the more obvious ones must have been understood and assented to as general truths before it was ever heard of. We should never have thought of affirming that all phenomena take place according to general laws, if we had not first arrived, in the case of a great multitude of phenomena, at some knowledge of the laws themselves; which could be done no otherwise than by induction. In what sense, then, can a principle, which is so far from being our earliest induction, be regarded as our warrant for all the others? In the only sense, in which (as we have already seen) the general propositions which we place at the head of our reasonings when we throw them into syllogisms, ever really contribute to their validity. As **Archbishop Whately** remarks, every induction is a syllogism with the major

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premiss suppressed; or (as I prefer expressing it) every induction may be thrown into the form of a syllogism, by supplying a major premiss. If this be actually done, the principle which we are now considering, that of the uniformity of the course of nature, will appear as the ultimate major premiss of all inductions, and will, therefore, stand to all inductions in the relation in which, as has been shown at so much length, the major proposition of a syllogism always stands to the conclusion; not contributing at all to prove it, but being a necessary condition of its being proved; since no conclusion is proved for which there cannot be found a true major premiss.

The statement, that the uniformity of the course of nature is the ultimate major premiss in all cases of induction, may be thought to require some explanation. The immediate major premiss in every inductive argument, it certainly is not. Of that, Archbishop Whateley's must be held to be the correct account. The induction, "John Peter, &c., are mortal, therefore all mankind are mortal," may, as he justly says, be thrown into a syllogism by prefixing as a major premiss (what is at any rate a necessary condition of the validity of the argument) namely, that what is true of John, Peter, &c., is true of all mankind. But how come we by this major premiss? It is not self-evident; nay, in all cases of unwarranted generalization, it is not true. How, then, is it arrived at? Necessarily either by induction or rationation; and if by induction, the process, like all other inductive arguments, may be thrown into the form of a syllogism. This previous syllogism it is, therefore, necessary to construct. There is, in the long run, only one possible construction. The real proof that what is true of John, Peter, &c., is true of all mankind, can only be, that a different supposition would be inconsistent with the uniformity which we know to exist in the course of nature. Whether there would be this inconsistency or not, may be a matter of long and delicate inquiry; but unless there would, we have no sufficient ground for the major of the inductive syllogism. It hence appears, that if we throw the whole course of any inductive argument into a series of syllo-

gisms, we shall arrive by more or fewer steps at an ultimate syllogism, which will have for its major premiss the principle, or axiom, of the uniformity of the course of nature.

It was not to be expected that in the case of this axiom, any more than of other axioms, there should be unanimity among thinkers with respect to the grounds on which it is to be received as true. I have already stated that I regard it as itself a generalization from experience. Others hold it to be a principle which, antecedently to any verification by experience, we are compelled by the constitution of our thinking faculty to assume as true. Having so recently, and at so much length, combated a similar doctrine as applied to the axioms of mathematics, by arguments which are in a great measure applicable to the present case, I shall defer the more particular discussion of this controverted point in regard to the fundamental axiom of induction, until a more advanced period of our inquiry. At present it is of more importance to understand thoroughly the import of the axiom itself. For the proposition, that the course of nature is uniform, possesses rather the brevity suitable to popular, than the precision requisite in philosophical, language: its terms require to be explained, and a stricter than their ordinary signification given to them, before the truth of the assertion can be admitted.

§ 2. Every person's consciousness assures him that he does not always expect uniformity in the course of events; he does not always believe that the unknown will be similar to the known, that the future will resemble the past. Nobody believes that the succession of rain and fine weather will be the same in every future year as in the present. Nobody expects to have the same dreams repeated every night. On the contrary, everybody mentions it as something extraordinary, if the course of nature is constant, and resembles itself, in these particulars. To look for constancy where constancy is not to be expected, as for instance, that a day which has once brought good fortune will always be a fortunate day, is justly accounted superstition.

The course of nature, in truth, is not only uniform, it is also in-

initely various. Some phenomena are always seen to recur in the very same combinations in which we met with them at first; others seem altogether capricious; while some, which we had been accustomed to regard as bound down exclusively to a particular set of combinations, we unexpectedly find detached from some of the elements with which we had hitherto found them conjoined, and united to others of quite a contrary description. To an inhabitant of Central Africa, fifty years ago, no fact probably appeared to rest on more uniform experience than this, that all human beings are black. To Europeans, not many years ago, the proposition, All swans are white, appeared an equally unequivocal instance of uniformity in the course of nature. Further experience has proved to both that they were mistaken; but they had to wait fifty centuries for this experience. During that long time, mankind believed in an uniformity of the course of nature where no such uniformity really existed.

According to the notion which the ancients entertained of induction, the foregoing were cases of as legitimate inference as any inductions whatever. In these two instances, in which, the conclusion being false, the ground of inference must have been insufficient, there was, nevertheless, as much ground for it as this conception of induction admitted of. The induction of the ancients has been well described by Bacon, under the name of "Inductio per enumerationem simplicem, ubi non reperitur instantia contradictoria." It consists in ascribing the character of general truths to all propositions which are true in every instance that we happen to know of. This is the kind of induction which is natural to the mind when unaccustomed to scientific methods. The tendency, which some call an instinct, and which others account for by association, to infer the future from the past, the known from the unknown, is simply a habit of expecting that what has been found true once or several times, and never yet found false, will be found true again. Whether the instances are few or many, conclusive or inconclusive, does not much affect the matter: these are considerations which occur only on reflection: the unprompted tendency of the mind is to generalize its experience, provided this points all in one direction; provided no

other experience of a conflicting character comes unsought. The notion of seeking it, of experimenting for it, of *interrogating* nature (to use Bacon's expression) is of much later growth. The observation of nature, by uncultivated intellects, is purely passive: they accept the facts which present themselves, without taking the trouble of searching for more: it is a superior mind only which asks itself what facts are needed to enable it to come to a sure conclusion, and then looks out for these.

But though we have always a propensity to generalize from unvarying experience, we are not always warranted in doing so. Before we can be at liberty to conclude that something is universally true because we have never known an instance to the contrary, we must have reason to believe that if there were in nature any instances to the contrary, we should have known of them. This assurance, in the great majority of cases, we cannot have, or can have only in a very moderate degree. The possibility of having it, is the foundation on which we shall see hereafter that induction by simple enumeration may in some remarkable cases amount practically to proof. No such assurance, however, can be had, on any of the ordinary subjects of scientific inquiry. Popular notions are usually founded on induction by simple enumeration; in science it carries us but a little way. We are forced to begin with it; we must often rely on it provisionally, in the absence of means of more searching investigation. But, for the accurate study of nature, we require a surer and a more potent instrument.

It was, above all, by pointing out the insufficiency of this rude and loose conception of Induction, that Bacon merited the title so generally awarded to him, of Founder of the Inductive philosophy. The value of his own contributions to a more philosophical theory of the subject has certainly been exaggerated. Although (along with some fundamental errors) his writings contain, more or less fully developed, several of the most important principles of the Inductive Method, physical investigation has now far outgrown the Baconian conception of Induction. Moral and political inquiry, indeed, are as yet far behind that conception. The cur-

rent and approved modes of reasoning on these subjects are still of the same vicious description against which Bacon protested: the method almost exclusively employed by those professing to treat such matters inductively, is the very *inductio per enumerationem simplicem* which he condemns; and the experience which we hear so confidently appealed to by all sects, parties, and interests, is still, in his own emphatic words, *mera palpatio*.

§ 3. In order to a better understanding of the problem which the logician must solve if he would establish a scientific theory of Induction, let us compare a few cases of incorrect inductions with others which are acknowledged to be legitimate. Some, we know, which were believed for centuries to be correct, were nevertheless incorrect. That all swans are white, cannot have been a good induction, since the conclusion has turned out erroneous. The experience, however, on which the conclusion rested was genuine. From the earliest records, the testimony of the inhabitants of the known world was unanimous on the point. The uniform experience, therefore, of the inhabitants of the known world, agreeing in a common result, without one known instance of deviation from that result, is not always sufficient to establish a general conclusion.

But let us now turn to an instance apparently not very dissimilar to this. Mankind were wrong, it seems, in concluding that all swans were white: are we also wrong, when we conclude that all men's heads grow above their shoulders, and never below, in spite of the conflicting testimony of the naturalist Pliny? As there were black swans, though civilized people had existed for three thousand years on the earth without meeting with them, may there not also be "men whose heads do grow beneath their shoulders," notwithstanding a rather less perfect unanimity of negative testimony from observers? Most persons would answer No; it was more credible that a bird should vary in its color, than that men should vary in the relative position of their principal organs. And there is no doubt that in so saying they would be right: but to say why they are right, would be impossible, without entering more deeply than is usually done, into the true theory of Induction.

Again, there are cases in which we reckon with the most unfailing confidence upon uniformity, and other cases in which we do not count upon it at all. In some we feel complete assurance that the future will resemble the past, the unknown be precisely similar to the known. In others, however invariable may be the result obtained from the instances which have been observed, we draw from them no more than a very feeble presumption that the like result will hold in all other cases. That a straight line is the shortest distance between two points, we do not doubt to be true even in the region of the fixed stars. When a chemist announces the existence and properties of a newly-discovered substance, if we confide in his accuracy, we feel assured that the conclusions he has arrived at will hold universally, although the induction be founded but on a single instance. We do not withhold our assent, waiting for a repetition of the experiment; or if we do, it is from a doubt whether the one experiment was properly made, not whether if properly made it would be conclusive. Here, then, is a general law of nature, inferred without hesitation from a single instance; an universal proposition from a singular one. Now mark another case, and contrast it with this. Not all the instances which have been observed since the beginning of the world, in support of the general proposition that all crows are black, would be deemed a sufficient presumption of the truth of the proposition, to outweigh the testimony of one unexceptionable witness who should affirm that in some region of the earth not fully explored, he had caught and examined a crow, and had found it to be grey.

Why is a single instance, in some cases, sufficient for a complete induction, while in others, myriads of concurring instances, without a single exception known or presumed, go such a very little way towards establishing an universal proposition? Whoever can answer this question knows more of the philosophy of logic than the wisest of the ancients, and has solved the problem of induction.

CHAPTER IV.

OF LAWS OF NATURE.

§ 1. In the contemplation of that uniformity in the course of nature, which is assumed in every inference from experience, one of the first observations that present themselves is, that the uniformity in question is not properly uniformity, but uniformities. The general regularity results from the co-existence of partial regularities. The course of nature in general is constant, because the course of each of the various phenomena that compose it is so. A certain fact invariably occurs whenever certain circumstances are present, and does not occur when they are absent; the like is true of another fact; and so on. From these separate threads of connexion between parts of the great whole which we term nature, a general tissue of connexion unavoidably weaves itself, by which the whole is held together. If A is always accompanied by D, B by E, and C by F, it follows that A B is accompanied by D E, A C by D F, B C by E F, and finally A B C by D E F; and thus the general character of regularity is produced, which, along with and in the midst of infinite diversity, pervades all nature.

The first point, therefore, to be noted in regard to what is called the uniformity of the course of nature, is, that it is itself a complex fact, compounded of all the separate uniformities which exist in respect to single phenomena. These various uniformities, when ascertained by what is regarded as a sufficient induction, we call in common parlance, Laws of Nature. Scientifically speaking, that title is employed in a more restricted sense, to designate the uniformities when reduced to their most simple expression. Thus in the illustration already employed, there were seven uniformities; all of which, if considered sufficiently certain, would in the more lax application of the term, be called laws of nature. But of the seven, three alone are properly distinct and independent; these being pre-supposed, the others follow of course: the three first, therefore, according to the stricter accep-

tation, are called laws of nature, the remainder not; because they are in truth mere *cases* of the three first; virtually included in them; said, therefore, to *result* from them: whoever affirms those three has already affirmed all the rest.

To substitute real examples for symbolical ones, the following are three uniformities, or call them laws of nature: the law that air has weight, the law that pressure on a fluid is propagated equally in all directions, and the law that pressure in one direction, not opposed by equal pressure in the contrary direction, produces motion, which does not cease until equilibrium is restored. From these three uniformities we should be able to predict another uniformity, namely, the rise of the mercury in the Torricellian tube. This, in the stricter use of the phrase, is not a law of nature. It is result of laws of nature. It is a *case* of each and every one of the three laws; and is the only occurrence by which they could all be fulfilled. If the mercury were not sustained in the barometer, and sustained at such a height that the column of mercury were equal in weight to a column of the atmosphere of the same diameter; here would be a case, either of the air not pressing upon the surface of the mercury with the force which is called its weight, or of the downward pressure on the mercury not being propagated equally in an upward direction, or of a body pressed in one direction and not in the direction opposite, either not moving in the direction in which it is pressed, or stopping before it had attained equilibrium. If we knew, therefore, the three simple laws, but had never tried the Torricellian experiment, we might *deduce* its result from those laws. The known weight of the air, combined with the position of the apparatus, would bring the mercury within the first of the three inductions; the first induction would bring it within the second, and the second within the third, in the manner which we characterized in treating of Ratiocination. We should thus — to know the more complex uniformity, independently of specific experience, through our knowledge of the simpler ones from which it results; although, for reasons which will appear here after, *verification* by specific experience would still be desirable, and might possibly be indispensable.

Complex uniformities which, like this, are mere cases of simpler ones, and have, therefore, been virtually affirmed in affirming those, may with propriety be called *laws*, but can scarcely, in the strictness of scientific speech, be termed Laws of Nature. It is the custom in science, wherever regularity of any kind can be traced, to call the general proposition which expresses the nature of that regularity, a *law*; as when, in mathematics, we speak of the law of decrease of the successive terms of a converging series. But the expression, *law of nature*, has generally been employed with a sort of tacit reference to the original sense of the word *law*, namely, the expression of the will of a superior. When, therefore, it appeared that any of the uniformities which were observed in nature, would result spontaneously from certain other uniformities, no separate act of creative will being supposed necessary for the production of the derivative uniformities, these have not usually been spoken of as laws of nature. According to another mode of expression, the question, What are the laws of nature? may be stated thus:—What are the fewest and simplest assumptions, which being granted, the whole existing order of nature would result? Another mode of stating it would be thus: What are the fewest general propositions from which all the uniformities which exist in the universe might be deductively inferred?

Every great advance which marks an epoch in the progress of science, has consisted in a step made towards the solution of this problem. Even a simple colligation of inductions already made, without any fresh extension of the inductive inference, is already an advance in that direction. When Kepler expressed the regularity which exists in the observed motions of the heavenly bodies, by the three general propositions called his laws, he, in so doing, pointed out three simple suppositions which, instead of a much greater number, would suffice to construct the whole scheme of the heavenly motions, so far as it was known up to that time. A similar and still greater step was made when these laws, which at first did not seem to be included in any more general truths, were discovered to be cases of the three laws of motion, as obtaining among bodies which mutually tend towards

one another with a certain force, and have had a certain instantaneous impulse originally impressed upon them. After this great discovery, Kepler's three propositions, though still called laws, would hardly, by any person accustomed to use language with precision, be termed laws of nature: that phrase would be reserved for the simpler laws into which Newton is said to have resolved them.

According to this language, every well-grounded inductive generalization is either a law of nature, or a result of laws of nature, capable, if those laws are known, of being predicted from them. And the problem of Inductive Logic may be summed up in two questions: how to ascertain the laws of nature; and how, after having ascertained them, to follow them into their results. On the other hand, we must not suffer ourselves to imagine that this mode of statement amounts to a real analysis, or to anything but a mere verbal transformation of the problem; for the expression, Laws of Nature, *means* nothing but the uniformities which exist among natural phenomena (or, in other words, the results of induction), when reduced to their simplest expression. It is, however, something, to have advanced so far, as to see that the study of nature is the study of laws, not *a* law; or uniformities, in the plural number: that the different natural phenomena have their separate rules or modes of taking place, which, though much intermixed and entangled with one another, may, to a certain extent, be studied apart: that (to resume our former metaphor) the regularity which exists in nature is a web composed of distinct threads, and only to be understood by tracing each of the threads separately; for which purpose it is often necessary to unravel some portion of the web, and exhibit the fibres apart. The rules of experimental inquiry are the contrivances for unravelling the web.

CHAPTER V.

OF THE LAW OF UNIVERSAL CAUSATION.

§ 1. The phenomena of nature exist in two distinct relations to one another; that of simultaneity, and that of succession. Every

phenomenon is related, in an uniform manner, to some phenomena that coexist with it, and to some that have preceded or will follow it.

Of the uniformities which exist among synchronous phenomena, the most important, on every account, are the laws of number; and next to them those of space, or in other words, of extension and figure. The laws of number are common to synchronous and successive phenomena. That two and two make four, is equally true whether the second two follow the first two or accompany them. It is as true of days and years as of feet and inches. The laws of extension and figure, (in other words, the theorems of geometry, from its lowest to its highest branches,) are, on the contrary, laws of simultaneous phenomena only. The various parts of space, and of the objects which are said to fill space, coexist; and the unvarying laws which are the subject of the science of geometry, are an expression of the mode of their coexistence.

This is a class of laws, or in other words, of uniformities, for the comprehension and proof of which it is not necessary to suppose any lapse of time, any variety of facts or events succeeding one another. If all the objects in the universe were unchangeably fixed, and had remained in that condition from eternity, the propositions of geometry would still be true of those objects. All things which possess extension, or in other words, which fill space, are subject to geometrical laws. Possessing extension, they possess figure; possessing figure, they must possess some figure in particular, and have all the properties which geometry assigns to that figure. If one body be a sphere and another a cylinder, of equal height and diameter, the one will be exactly two-thirds of the other, let the nature and quality of the material be what it will. Again, each body, and each point of a body, must occupy some place or position among other bodies; and the position of two bodies relatively to each other, of whatever nature the bodies be, may be unerringly inferred from the position of each of them relatively to any third body.

In the laws of number, then, and in those of space, we recognize, in the most unqualified manner, the rigorous universality of

which we are in quest. Those laws have been in all ages the type of certainty, the standard of comparison for all inferior degrees of evidence. Their invariability is so perfect, that we are unable even to conceive any exception to them; and philosophers have been led, although (as I have endeavoured to show) erroneously, to consider their evidence as lying not in experience, but in the original constitution of the intellect. If, therefore, from the laws of space and number, we were able to deduce uniformities of any other description, this would be conclusive evidence to us that those other uniformities possessed the same degree of rigorous certainty. But this we cannot do. From laws of space and number alone, nothing can be deduced but laws of space and number.

Of all truths relating to phenomena, the most valuable to us are those which relate to the order of their succession. On a knowledge of these is founded every reasonable anticipation of future facts, and whatever power we possess of influencing those facts to our advantage. Even the laws of geometry are chiefly of practical importance to us as being a portion of the premisses from which the order of the succession of phenomena may be inferred. Inasmuch as the motion of bodies, the action of forces, and the propagation of influences of all sorts, take place in certain lines and over definite spaces, the property of those lines and spaces are an important part of the laws to which those phenomena are themselves subject. Again, motions, forces or other influences, and times, are numerable quantities; and the properties of number are applicable to them as to all other things. But though the laws of number and space are important elements in the ascertainment of uniformities of succession, they can do nothing towards it when taken by themselves. They can only be made instrumental to that purpose when we combine with them additional premisses, expressive of uniformities of succession already known. By taking, for instance, as premisses these propositions, that bodies acted upon by an instantaneous force move with uniform velocity in straight lines; that bodies acted upon by a continuous force move with accelerated velocity in straight lines; and that bodies acted upon by two forces in different directions move in the diagonal of a parallelogram, whose sides represent the direction

and quantity of those forces; we may by combining these truths with propositions relating to the properties of straight lines and of parallelograms, (as that a triangle is half of a parallelogram of the same base and altitude,) deduce another important uniformity of succession, viz., that a body moving round a centre of force describes areas proportional to the times. But unless there had been laws of succession in our premisses, there could have been no truths of succession in our conclusions. A similar remark might be extended to every other class of phenomena really peculiar; and, had it been attended to, would have prevented many chimerical attempts at demonstrations of the indemonstrable, and explanations which do not explain.

It is not, therefore, enough for us that the laws of space, which are only laws of simultaneous phenomena, and the laws of number, which though true of successive phenomena do not relate to their succession, possess the rigorous certainty and universality of which we are in search. We must endeavour to find some law of succession which has those same attributes, and is therefore fit to be made the foundation of processes for discovering, and of a test for verifying, all other uniformities of succession. This fundamental law must resemble the truths of geometry in their most remarkable peculiarity, that of never being, in any instance whatever, defeated or suspended by any change of circumstances.

Now among all those uniformities in the succession of phenomena, which common observation is sufficient to bring to light, there are very few which have any, even apparent, pretensions to this rigorous indefeasibility: and of those few, one only has been found capable of completely sustaining it. In that one, however, we recognize a law which is universal also in another sense; it is coextensive with the entire field of successive phenomena, all instances whatever of succession being examples of it. This law is the Law of Causation. The truth, that every fact which has a beginning has a cause, is coextensive with human experience.

This generalization may appear to some minds not to amount to much, since after all it asserts only this: "it is a law, that every event depends on some law." We must not, however, conclude

that the generality of the principle is merely verbal; it will be found on inspection to be no vague or unmeaning assertion, but a most important and really fundamental truth.

§ 2. The notion of Cause being the root of the whole theory of Induction, it is indispensable that this idea should, at the very outset of our inquiry, be, with the utmost practicable degree of precision, fixed and determined. If, indeed, it were necessary for the purpose of inductive logic that the strife should be quelled, which has so long raged among the different schools of metaphysicians, respecting the origin and analysis of our idea of causation; the promulgation, or at least the general reception, of a true theory of induction, might be considered desperate, for a long time to come. But the science of the Investigation of Truth by means of Evidence, is happily independent of many of the controversies which perplex the science of the ultimate constitution of the human mind, and is under no necessity of pushing the analysis of mental phenomena to that extreme limit which alone ought to satisfy a metaphysician.

I premise, then, that when in the course of this inquiry I speak of the cause of any phenomenon, I do not mean a cause which is not itself a phenomenon; I make no research into the ultimate, or ontological cause of anything. To adopt a distinction familiar in the writings of the Scotch metaphysicians, and especially of Reid, the causes with which I concern myself are not *efficient*, but *physical* causes. They are causes in that sense alone, in which one physical fact is said to be the cause of another. Of the efficient causes of phenomena, or whether any such causes exist at all, I am not called upon to give an opinion. The notion of causation is deemed, by the schools of metaphysics most in vogue at the present moment, to imply a mysterious and most powerful tie, such as cannot, or at least does not, exist between any physical fact and that other physical fact on which it is invariably consequent, and which is popularly termed its cause: and thence is deduced the supposed necessity of ascending higher, into the essences and inherent constitution of things, to find the true cause, the cause which is not only followed by, but actually *produces*, the effect. No such necessity exists for the purposes of the present inquiry, nor will any such doctrine be found in the fol-

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lowing pages. But neither will there be found anything incompatible with it. We are in no way concerned in the question. The only notion of a cause, which the theory of induction requires, is such a notion as can be gained from experience. The Law of Causation, the recognition of which is the main pillar of inductive science, is but the familiar truth, that invariability of succession is found by observation to obtain between every fact in nature and some other fact which has preceded it; independently of all considerations respecting the ultimate mode of production of phenomena, and of every other question regarding the nature of "Things in themselves."

Between the phenomena, then, which exist at any instant, and the phenomena which exist at the succeeding instant, there is an invariable order of succession; and, as we said in speaking of the general uniformity of the course of nature, this web is composed of separate fibres; this collective order is made up of particular sequences, obtaining invariably among the separate parts. To certain facts, certain facts always do, and, as we believe, will continue to, succeed. The invariable antecedent is termed the cause; the invariable consequent, the effect. And the universality of the law of causation consists in this, that every consequent is connected in this manner with some particular antecedent, or set of antecedents. Let the fact be what it may, if it has begun to exist, it was preceded by some fact or facts, with which it is invariably connected. For every event there exists some combination of objects or events, some given concurrence of circumstances, positive and negative, the occurrence of which is always followed by that phenomenon. We may not have found out what this concurrence of circumstances may be; but we never doubt that there is such a one, and that it never occurs without having the phenomenon in question as its effect or consequence. On the universality of this truth depends the possibility of reducing the inductive process to rules. The undoubted assurance we have that there is a law to be found if we only knew how to find it, will be seen presently to be the source from which the canons of the Inductive Logic derive their validity.

§ 3. It is seldom, if ever, between a consequent and a single antecedent, that this invariable sequence subsists. It is usually between a consequent and the sum of several antecedents; the concurrence of all of them being requisite to produce, that is, to be certain of being followed by, the consequent. In such cases it is very common to single out one only of the antecedents under the denomination of Cause, calling the others merely Conditions. Thus, if a person eats of a particular dish, and dies in consequence, that is, would not have died if he had not eaten of it, people would be apt to say that eating of that dish was the cause of his death. There needs not, however, be any invariable connexion between eating of the dish and death; but there certainly is, among the circumstances which took place, some combination or other on which death is invariably consequent: as, for instance, the act of eating of the dish, combined with a particular bodily constitution, a particular state of present health, and perhaps even a certain state of the atmosphere; the whole of which circumstances perhaps constituted in this particular case the *conditions* of the phenomenon, or in other words, the set of antecedents which determined it, and but for which it would not have happened. The real Cause, is the whole of these antecedents; and we have, philosophically speaking, no right to give the name of cause to one of them, exclusively of the others. What, in the case we have supposed, disguises the incorrectness of the expression, is this: that the various conditions, except the single one of eating the food, were not *events* (that is, instantaneous changes, or successions of instantaneous changes) but *states*, possessing more or less of permanency; and might therefore have preceded the effect by an indefinite length of duration, for want of the event which was requisite to complete the required concurrence of conditions; while as soon as that event, eating the food, occurs, no other cause is waited for, but the effect begins immediately to take place: and hence the appearance is presented of a more immediate and close connexion between the effect and that one antecedent, than between the effect and the remaining conditions. But though we may think proper to give the name of cause to that one condition, the fulfilment of which completes the tale, and

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brings about the effect without further delay; this condition has really no closer relation to the effect than any of the other conditions has. The production of the consequent required that they should all *exist* immediately previous, though not that they should all *begin* to exist immediately previous. The statement of the cause is incomplete, unless in some shape or other we introduce all the conditions. A man takes mercury, goes out of doors, and catches cold. We say, perhaps, that the cause of his taking cold was exposure to the air. It is clear, however, that his having taken mercury may have been a necessary condition of his catching cold; and though it might consist with usage to say that the cause of his attack was exposure to the air, to be accurate we ought to say that the cause was exposure to the air while under the effect of mercury.

If we do not, when aiming at accuracy, enumerate all the conditions, it is only because some of them will in most cases be understood without being expressed, or because for the purpose in view they may without detriment be overlooked. For example, when we say, the cause of a man's death was that his foot slipped in climbing a ladder, we omit as a thing unnecessary to be stated the circumstance of his weight, though quite as indispensable a condition of the effect which took place. When we say that the assent of the crown to a bill makes it law, we mean that the assent, being never given until all the other conditions are fulfilled, makes up the sum of the conditions, though no one now regards it as the principal one. When the decision of a legislative assembly has been determined by the casting vote of the chairman, we sometimes say that this one person was the cause of all the effects which resulted from the enactment. Yet we do not really suppose that his single vote contributed more to the result than that of any other person who voted in the affirmative; but, for the purpose we have in view, which is to insist on his share of the responsibility, the part which any other person had in the transaction is not material.

In all these instances the fact which was dignified by the name of cause, was the one condition which came last into existence. But it must not be supposed that in the employment of the term

this or any other rule is always adhered to. Nothing can better shew the absence of any scientific ground for the distinction between the cause of a phenomenon and its conditions, than the capricious manner in which we select from among the conditions that which we choose to denominate the cause. However numerous the conditions may be, there is hardly any of them which may not, according to the purpose of our immediate discourse, obtain that nominal pre-eminence. This will be seen by analysing the conditions of some one familiar phenomenon. For example, a stone thrown into water falls to the bottom. What are the conditions of this event? In the first place there must be a stone, and water, and the stone must be thrown into the water; but, these suppositions forming part of the enunciation of the phenomenon itself, to include them also among the conditions would be a vicious tautology, and this class of conditions, therefore, have never received the name of cause from any but the schoolmen, by whom they were called the *material cause, causa materialis*. The next condition is, there must be an earth: and accordingly it is often said, that the fall of a stone is caused by the earth; or by a power or property of the earth, or a force exerted by the earth, all of which are merely roundabout ways of saying that it is caused by the earth; or, lastly, the earth's attraction; which also is only a technical mode of saying that the earth causes the motion, with the additional particularity that the motion is *towards* the earth, which is not a character of the cause, but of the effect. Let us now pass to another condition. It is not enough that the earth should exist; the body must be within that distance from it, in which the earth's attraction preponderates over that of any other body. Accordingly we may say, and the expression would be confessedly correct, that the cause of the stone's falling is its being *within the sphere* of the earth's attraction. We proceed to a further condition. The stone is immersed in water: it is therefore a condition of its reaching the ground, that its specific gravity exceed that of the surrounding fluid, or in other words that it surpass in weight an equal volume of water. Accordingly any one would be acknowledged to speak correctly who said, that the cause of the stone's going to the bottom is its exceeding in specific gravity the fluid in which it is immersed.

Thus we see that each and every condition of the phenomenon may be taken in its turn, and, with equal propriety in common parlance, but with equal impropriety in scientific discourse, may be spoken of as if it were the entire cause. And in practice that particular condition is usually styled the cause, whose share in the matter is superficially the most conspicuous, or whose requisiteness to the production of the effect we happen to be insisting on at the moment. So great is the force of this last consideration, that it sometimes induces us to give the name of cause even to one of the negative conditions. We say, for example, The army was surprised because the sentinel was off his post. But since the sentinel's absence was not what created the enemy, or put the soldiers asleep, how did it cause them to be surprised? All that is really meant is, that the event would not have happened if he had been at his duty. His being off his post was no producing cause, but the mere absence of a preventing cause: it was simply equivalent to his non-existence. From nothing, from a mere negation, no consequences can proceed. All effects are connected, by the law of causation, with some set of *positive* conditions; negative ones, it is true, being almost always required in addition. In other words, every fact or phenomenon which has a beginning, invariably arises when some certain combination of positive facts exist, provided certain other facts do not exist.

There is, no doubt, a tendency (which our first example, that of death from taking a particular food, sufficiently illustrates) to associate the idea of causation with the proximate antecedent *event*, rather than with any of the antecedent *states*, or permanent facts, which may happen also to be conditions of the phenomenon; the reason being that the event not only exists, but begins to exist, immediately previous; while the other conditions may have preexisted for an indefinite time. And this tendency shows itself very visibly in the different logical fictions which are resorted to, even by men of science, to avoid the necessity of giving the name of cause to anything which had existed for an indeterminate length of time before the effect. Thus, rather than say that the earth causes the fall of bodies, they ascribe it to a *force* exerted by the earth, or an *attraction* by the earth, abstractions

which they can represent to themselves as exhausted by each effort, and therefore constituting at each successive instant a fresh fact, simultaneous with, or only immediately preceding, the effect. Inasmuch as the coming of the circumstance which completes the assemblage of conditions, is a change or event, it thence happens that an event is always the antecedent in closest apparent proximity to the consequent; and this may account for the illusion which disposes us to look upon the proximate event as standing more peculiarly in the position of a cause than any of the antecedent states. But even this peculiarity, of being in closer proximity to the effect than any other of its conditions, is, as we have already seen, far from being necessary to the common notion of a cause; with which notion, on the contrary, any one of the conditions, either positive or negative, is found, on occasion, completely to accord.

The cause, then, philosophically speaking, is the sum total of the conditions, positive and negative, taken together; the whole of the contingencies of every description, which being realized, the consequent invariably follows. The negative conditions, however, of any phenomenon, a special enumeration of which would generally be very prolix, may be all summed up under one head, namely, the absence of preventing or counteracting causes. The convenience of this mode of expression is mainly grounded on the fact, that the effects of any cause in counteracting another cause may in most cases be, with strict scientific exactness, regarded as a mere extension of its own proper and separate effects. If gravity retards the upward motion of a projectile, and deflects it into a parabolic trajectory, it produces, in so doing, the very same kind of effect, and even (as mathematicians know) the same quantity of effect, as it does in its ordinary operation of causing the fall of bodies when simply deprived of their support. If an alkaline solution mixed with an acid destroys its sourness, and prevents it from reddening vegetable blues, it is because the specific effect of the alkali is to combine with the acid, and form a compound with totally different qualities. This property, which causes of all descriptions possess, of preventing the effects of other causes by virtue (for the most part) of the same laws, according

to which they produce their own, enables us, by establishing the general axiom that all causes are liable to be counteracted in their effects by one another, to dispense with the consideration of negative conditions entirely, and limit the notion of cause to the assemblage of the positive conditions of the phenomenon: one negative condition invariably understood, and the same in all instances (namely, the absence of all counteracting causes) being sufficient, along with the sum of the positive conditions, to make up the whole set of circumstances on which the phenomenon is dependent.

§ 4. Among the positive conditions, as we have seen that there are some to which, in common parlance, the term cause is more readily and frequently awarded, so there are others to which it is, in ordinary circumstances, refused. In most cases of causation a distinction is commonly drawn between something which acts, and some other thing which is acted upon; between an *agent* and a *patient*. Both of these, it would be universally allowed, are conditions of the phenomenon; but it would be thought absurd to call the latter the cause, that title being reserved for the former. The distinction, however, vanishes on examination, or rather is found to be only verbal; arising from an incident of mere expression, namely, that the object said to be *acted upon*, and which is considered as the scene in which the effect takes place, is commonly included in the phrase by which the effect is spoken of, so that if it were also reckoned as part of the cause, the seeming incongruity would arise of its being supposed to cause itself. In the instance which we have already had, of falling bodies, the question was thus put:—What is the cause which makes a stone fall? and if the answer had been “the stone itself,” the expression would have been in apparent contradiction to the meaning of the word cause. The stone, therefore, is conceived as the patient, and the earth (or, according to the common and most unphilosophical practice, some occult quality of the earth) is represented as the agent, or cause. But that there is nothing fundamental in the distinction may be seen from this, that it is quite possible to conceive the stone as causing its own fall, provided the language employed be such as to save the mere verbal incongruity. We might say that

the stone moves towards the earth by the properties of the matter composing it; and according to this mode of presenting the phenomenon, the stone itself might without impropriety be called the agent; although, to save the established doctrine of the inactivity of the matter, men usually prefer here also to ascribe the effect to an occult quality, and say that the cause is not the stone itself, but the *weight* or *gravitation* of the stone.

Those who have contended for a radical distinction between agent and patient, have generally conceived the agent as that which causes some state of, or some change in the state of, another object which is called the patient. But a little reflection will show that the license we assume of speaking of phenomena as *states* of the various objects which take part in them, (an artifice of which so much use has been made by some philosophers, Brown in particular, for the apparent explanation of phenomena,) is simply a sort of logical fiction, useful sometimes as one among several modes of expression, but which should never be supposed to be the statement of a scientific truth. Even those attributes of an object which might seem with greatest propriety to be called states of the object itself, its sensible qualities, its color, hardness, shape, and the like, are, in reality, (as no one has pointed out more clearly than Brown himself,) phenomena of causation, in which the substance is distinctly the agent, or producing cause, the patient being our own organs, and those of other sentient beings. What we call states of objects, are always sequences into which those the objects enter, generally as antecedents or causes; and things are never more active than in the production of those phenomena in which they are said to be acted upon. Thus, in the example of a stone falling to the earth, according to the theory of gravitation the stone is as much an agent as the earth, which not only attracts, but is itself attracted by, the stone. In the case of a sensation produced in our organs, the laws of our organization, and even those of our minds, are as directly operative in determining the effect produced, as the laws of the outward object. Though we call prussic acid the agent of a person's death, the whole of the vital and organic properties of the patient are as actively instrumental as the poison, in the chain of

effects which so rapidly terminates his sentient existence. In the process of education, we may call the teacher the agent, and the scholar only the material acted upon; yet in truth all the facts which pre-existed in the scholar's mind exert either co-operating or counteracting agencies in relation to the teacher's efforts. It is not light alone which is the agent in vision, but light coupled with the active properties of the eye and brain, and with those of the visible object. The distinction between agent and patient is merely verbal: patients are always agents; in a great proportion, indeed, of all natural phenomena, they are so to such a degree as to react forcibly upon the causes which acted upon them: and even when this is not the case, they contribute, in the same manner as any of the other conditions, to the production of the effect of which they are vulgarly treated as the mere theatre. All the positive conditions of a phenomenon are alike agents, alike active; and in any expression of the cause which professes to be a complete one, none of them can with reason be excluded, except such as have already been implied in the words used for describing the effect; nor by including even these would there be incurred any but a merely verbal inconsistency.

§ 5. It now remains to advert to a distinction which is of first-rate importance both for clearing up the notion of cause, and for obviating a very specious objection often made against the view which we have taken of the subject.

When we define the cause of anything (in the only sense in which the present inquiry has any concern with causes) to be "the antecedent which it invariably follows," we do not use this phrase as exactly synonymous with "the antecedent which it invariably *has* followed in our past experience." Such a mode of conceiving causation would be liable to the objection very plausibly urged by Dr. Reid, namely, that according to this doctrine night must be the cause of day, and day the cause of night; since these phenomena have invariably succeeded one another from the beginning of the world. But it is necessary to our using the word cause, that we should believe not only that the antecedent always *has* been followed by the consequent, but that, as long as the present constitution of things endures, it always *will*

be so. And this would not be true of day and night. We do not believe that night will be followed by day under all imaginable circumstances, but only that it will be so *provided* the sun rises above the horizon. If the sun ceased to rise, which, for aught we know, may be perfectly compatible with the general laws of matter, night would be, or might be, eternal. On the other hand, if the sun is above the horizon, his light not extinct, and no opaque body between us and him, we believe firmly that unless a change takes place in the properties of matter, this combination of antecedents will be followed by the consequent, day; that if the combination of antecedents could be indefinitely prolonged, it would be always day; and that if the same combination had always existed, it would always have been day, quite independently of night as a previous condition. Therefore is it that we do not call night the cause, nor even a condition, of day. The existence of the sun (or some such luminous body), and there being no opaque medium in a straight line between that body and the part of the earth where we are situated, are the sole conditions; and the union of these, without the addition of any superfluous circumstance, constitutes the cause. This is what writers mean when they say that the notion of cause involves the idea of necessity. If there be any meaning which confessedly belongs to the term necessity, it is *unconditionalness*. That which is necessary, that which *must* be, means that which will be, whatever supposition we may make in regard to all other things. The succession of day and night evidently is not necessary in this sense. It is conditional on the occurrence of other antecedents. That which will be followed by a given consequent when, and only when, some third circumstance also exists, is not the cause, even though no case should have ever occurred in which the phenomena took place without it.

Invariable sequence, therefore, is not synonymous with causation, unless the sequence, besides being invariable, is unconditional. There are sequences, as uniform in past experience as any others whatever, which yet we do not regard as cases of causation, but as conjunctions in some sort accidental. Such, to an accurate thinker, is that of day and night. The one might have

existed for any length of time, and the other not have followed the sooner for its existence; it follows only if certain other antecedents exist; and where those antecedents existed, it would follow in any case. No one, probably, ever called night the cause of day; mankind must so soon have arrived at the very obvious generalization, that the state of general illumination which we call day would follow the presence of a sufficiently luminous body, whether darkness had preceded it or not.

We may define, therefore, the cause of a phenomenon, to be the antecedent, or the concurrence of antecedents, on which it is invariably and *unconditionally* consequent. Or if we adopt the convenient modification of the meaning of the word cause, which confines it to the assemblage of positive conditions without the negative, then instead of "unconditionally," we must say, "subject to no other than negative conditions."

It is evident, that from a limited number of unconditional sequences, there will result a much greater number of conditional ones. Certain causes being given, that is, certain antecedents which are unconditionally followed by certain consequents; the mere co-existence of these causes will give rise to an unlimited number of additional uniformities. If two causes exist together, the effects of both will exist together; and if many causes co-exist, these causes (by what we shall term hereafter, the intermixture of their laws) will give rise to new effects, accompanying or succeeding one another in some particular order, which order will be invariable while the causes continue to coexist, but no longer. The motion of the earth in a given orbit round the sun, is a series of changes which follow one another as antecedents and consequents, and will continue to do so while the sun's attraction, and the force with which the earth tends to advance in a direct line through space, continue to coexist in the same quantities as at present. But vary either of these causes, and the unvarying succession of motions would cease to take place. The series of the earth's motions, therefore, though a case of sequence invariable within the limits of human experience, is not a case of causation. It is not unconditional.

This distinction between the relations of succession which so far as we know are unconditional, and those relations, whether of succession or of co-existence, which, like the earth's motions, or the succession of day and night, depend on the existence or on the co-existence of other antecedent facts—corresponds to the great division which Dr. Whewell and other writers have made of the field of science, into the investigation of what they term the Laws of Phenomena, and the investigation of causes; a phraseology, as I conceive, not philosophically sustainable, inasmuch as the ascertainment of causes, such causes as the human faculties *can* ascertain, namely, causes which are themselves phenomena, is, therefore, merely the ascertainment of other and more universal Laws of Phenomena. Yet the distinction, however incorrectly expressed, is not only real, but is one of the fundamental distinctions in science; indeed it is on this alone, as we shall hereafter find, that the possibility rests of framing a rigorous Canon of Induction.

§ 6. Does a cause always stand with its effect in the relation of antecedent and consequent? Do we not often say of two simultaneous facts that they are cause and effect—as when we say that fire is the cause of warmth, the sun and moisture the cause of vegetation, and the like? Since a cause does not necessarily perish because its effect has been produced, the two things do very generally coexist; and there are some appearances, and some common expressions, seeming to imply not only that causes may, but that they must, be contemporaneous with their effects. *Cessante causâ cessat et effectus*, has been a dogma of the schools: the necessity for the continued existence of the cause in order to the continuance of the effect, seems to have been once a generally received doctrine. Kepler's numerous attempts to account for the motions of the heavenly bodies on mechanical principles, were rendered abortive by his always supposing that the force which set those bodies in motion must continue to operate in order to keep up the motion which it at first produced. Yet there were at all times many familiar instances of the continuance of effects, long after their causes had ceased. A *coup de soleil* gives a person a brain fever: will the fever go off as soon as he

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is moved out of the sunshine? A sword is run through his body: must the sword remain in his body in order that he may continue dead? A ploughshare once made, remains a ploughshare, without any continuance of heating and hammering, and even after the man who heated and hammered it has been gathered to his fathers. On the other hand, the pressure which forces up the mercury in an exhausted tube must be continued in order to sustain it in the tube. This (it may be replied) is because another force is acting without intermission, the force of gravity, which would restore it to its level, unless counterpoised by a force equally constant. But again; a tight bandage causes pain, which pain will sometimes go off as soon as the bandage is removed. The illumination which the sun diffuses over the earth ceases when the sun goes down.

There is, therefore, a distinction to be drawn. The conditions which are necessary for the first production of a phenomenon, are occasionally also necessary for its continuance; but more commonly its continuance requires no condition except negative ones. Most things, once produced, continue as they are, until something changes or destroys them; but some require the permanent presence of the agencies which produced them at first. These may, if we please, be considered as instantaneous phenomena, requiring to be renewed at each instant by the cause by which they were at first generated. Accordingly, the illumination of any given point of space has always been looked upon as an instantaneous fact, which perishes and is perpetually renewed as long as the necessary conditions subsist. If we adopt this language we avoid the necessity of admit'ing that the continuance of the cause is ever required to maintain the effect. We may say, it is not required to maintain, but to reproduce the effect, or else to counteract some force tending to destroy it. And this may be a convenient phraseology. But it is only a phraseology. The fact remains, that in some cases(though these are a minority) the continuance of the conditions which produced an effect is necessary to the continuance of the effect.

As to the ulterior question, whether it is strictly necessary that the cause, or assemblage of conditions, should precede, by ever

so short an instant, the production of the effect, (a question raised and argued with much ingenuity by a writer from whom I have quoted,) I think the inquiry an unimportant one. There certainly are cases in which the effect follows without any interval perceptible by our faculties; and when there is an interval, we cannot tell by how many intermediate links imperceptible to us that interval may really be filled up. But even granting that an effect may commence simultaneously with its cause, the view I have taken of causation is in no way practically affected. Whether the cause and its effect be necessarily successive or not, causation is still the law of the succession of phenomena. Everything which begins to exist must have a cause; what does not begin to exist does not need a cause; what causation has to account for is the origin of phenomena, and all the successions of phenomena must be resolvable into causation. These are the axioms of our doctrine. If these be granted, we can afford, though I see no necessity for doing so, to drop the words antecedent and consequent as applied to cause and effect. I have no objection to define a cause; the assemblage of phenomena, which occurring, some other phenomenon invariably commences, or has its origin. Whether the effect coincides in point of time with, or immediately follows, the hindmost of its conditions, is immaterial. At all events it does not precede it; and when we are in doubt, between two co-existent phenomena, which is cause and which effect, we rightly deem the question solved if we can ascertain which of them preceded the other.

§ 7. It continually happens that several different phenomena, which are not in the slightest degree dependent or conditional on one another, are found all to depend, as the phrase is, on one and the same agent; in other words, one and the same phenomenon is seen to be followed by several sorts of effects quite heterogeneous, but which go on simultaneously one with another; provided, of course, that all other conditions requisite for each of them also exist. Thus, the sun produces the celestial motions, it produces daylight, and it produces heat. The earth causes the fall of heavy bodies, and it also, in its capacity of an immense magnet, causes the phenomena of the magnetic needle. A crystal of galena

causes the sensations of hardness, of weight, of cubical form, of grey color, and many others between which we can trace no interdependence. The purpose to which the phraseology of Properties and Powers is specially adapted, is the expression of this sort of cases. When the same phenomenon is followed (either subject or not to the presence of other conditions) by effects of different and dissimilar orders, it is usual to say that each different sort of effect is produced by a different property of the cause. Thus we distinguish the attractive or gravitational property of the earth, and its magnetic property; the gravitational, luminiferous, and calorific properties of the sun; the colour, shape, weight, and hardness of a crystal. These are mere phrases, which explain nothing, and add nothing to our knowledge of the subject; but, considered as abstract names denoting the connexion between the different effects produced and the object which produces them, they are a very powerful instrument of abridgment, and of that acceleration of the process of thought which abridgment accomplishes.

This class of considerations leads to a conception which we shall find to be of great importance in the interpretation of nature; that of a Permanent Cause, or original natural agent. There exist in nature a number of permanent causes, which have subsisted ever since the human race has been in existence, and for an indefinite and probably enormous length of time previous. The sun, the earth, and planets, with their various constituents, air, water, and the other distinguishable substances, whether simple or compound, of which nature is made up, are such Permanent Causes. These have existed, and the effects or consequences which they were fitted to produce have taken place, (as often as the other conditions of the production met,) from the very beginning of our experience. But we can give no account of the origin of the Permanent causes themselves. Why these particular natural agents existed originally and no others, or why they are commingled in such and such proportions, and distributed in such and such a manner throughout space, is a question we cannot answer. More than this: we can discover nothing regular in the distribution itself; we can reduce it to no uniformity, to no law. There are no

means by which, from the distribution of these causes or agents in one part of space, we could conjecture whether a similar distribution prevails in another. The coexistence, therefore, of Primeval Causes, ranks, to us, among merely casual concurrences: and all those sequences or coexistences among the effects of several such causes, which, though invariable while those causes coexist, would, if the coexistence terminated, terminate along with it, we do not class as cases of causation, or laws of nature: we can only calculate on finding these sequences or coexistences where we know, by direct evidence, that the natural agents on the properties of which they ultimately depend, are distributed in the requisite manner. These Permanent Causes are not always objects; they are sometimes events, that is to say, periodical cycles of events, that being the only mode in which events can possess the property of permanence. Not only, for instance, is the earth itself a permanent cause, or primitive natural agent, but the earth's rotation is so too: it is a cause which has produced, from the earliest period (by the aid of other necessary conditions), the succession of day and night, the ebb and flow of the sea, and many other effects, while, as we can assign no cause (except conjecturally) for the rotation itself, it is entitled to be ranked as a primeval cause. It is, however, only the *origin* of the rotation which is mysterious to us: once begun, its continuance is accounted for by the first law of motion (that of the permanence of rectilinear motion once impressed) combined with the gravitation of the parts of the earth towards one another.

All phenomena without exception which begin to exist, that is, all except the primeval causes, are effects, either immediate or remote, of those primitive facts, or of some combination of them. There is no Thing produced, no event happening, in the known universe, which is not connected by an uniformity, or invariable sequence, with some one or more of the phenomena which preceded it; insomuch that it will happen again as often as those phenomena occur again, and as no other phenomenon having the character of a countering cause shall coexist. These antecedent phenomena, again, were connected in a similar manner with some that preceded them; and so on, until we reach, as the

ultimate step attainable by us, either the properties of some one primeval cause, or the conjunction of several. The whole of the phenomena of nature were therefore the necessary, or in other words, the unconditional, consequences of some former collocation of the Permanent Causes.

The state of the whole universe at any instant, we believe to be the consequence of its state at the previous instant; insomuch that one who knew all the agents which exist at the present moment, their collocation in space, and their properties, in other words the laws of their agency, could predict the whole subsequent history of the universe, at least unless some new volition of a power capable of controlling the universe should supervene. And if any particular state of the entire universe could ever recur a second time, all subsequent states would return too, and history would, like a circulating decimal of many figures, periodically repeat itself:—

Jam reddit et virgo, redeunt Saturnia regna....
 Alter erit tum Tiphys, et altera quæ vehat Argo
 Delectos heroas; erunt quoque altera bella,
 Atque iterum ad Troiam magnus mittetur Achilles.

And though things do not really revolve in this eternal round, the whole series of events in the history of the universe, past and future, is not the less capable, in its own nature, of being constructed *a priori* by any one whom we can suppose acquainted with the original distribution of all natural agents, and with the whole of their properties, that is, the laws of succession existing between them and their effects: saving the more than human powers of combination and calculation which would be required, even in one possessing the data, for the actual performance of the task.

CHAPTER VII.

OF OBSERVATION AND EXPERIMENT.

§ 1. It results from the preceding exposition, that the process of ascertaining what consequents, in nature, are invariably connected with what antecedents, or in other words what phenomena are related to each other as causes and effects, is in some sort

a process of analysis. That every fact which begins to exist has a cause, and that this cause must be found somewhere among the facts which immediately preceded the occurrence, may be taken for certain. The whole of the present facts are the infallible result of all past facts, and more immediately of all the facts which existed at the moment previous. Here, then, is a great sequence, which we know to be uniform. If the whole prior state of the entire universe could again recur, it would again be followed by the present state. The question is, how to resolve this complex uniformity into the simpler uniformities which compose it, and assign to each portion of the vast antecedent the portion of the consequent which is attendant on it.

This operation, which we have called analytical, inasmuch as it is the resolution of a complex whole into the component elements, is more than a merely mental analysis. No mere contemplation of the phenomena, and partition of them by the intellect alone, will of itself accomplish the end we have now in view. Nevertheless, such a mental partition is an indispensable first step. The order of nature, as perceived at a first glance, presents at every instant a chaos followed by another chaos. We must decompose each chaos into single facts. We must learn to see in the chaotic antecedents a multitude of distinct antecedents, in the chaotic consequent a multitude of distinct consequents. This, supposing it done, will not of itself tell us on which of the antecedents each consequent is invariably attendant. To determine that point, we must endeavour to effect a separation of the facts from one another, not in our minds only, but in nature. The mental analysis, however, must take place first. And every one knows that in the mode of performing it, one intellect differs immensely from another. It is the essence of the act of observing; for the observer is not he who merely sees the thing which is before his eyes, but he who sees what parts that thing is composed of. To do this well is a rare talent. One person, from inattention, or attending only in the wrong place, overlooks half of what he sees; another sets down much more than he sees, confounding it with what he imagines, or with what he infers; another takes note of the kind of all the circumstances, but being inexpert in

estimating their degree, leaves the quantity of each vague and uncertain; another sees indeed the whole, but makes such an awkward division of it into parts, throwing things into one mass which require to be separated, and separating others which might more conveniently be considered as one, that the result is much the same, sometimes even worse, than if no analysis had been attempted at all. It would be possible to point out what qualities of mind, and modes of mental culture, fit a person for being a good observer; that, however, is a question not of Logic, but of the theory of Education, in the most enlarged sense of the term. There is not properly an Art of Observing. There may be rules for observing. But these, like rules for inventing, are properly instructions for the preparation of one's own mind; for putting it into the state in which it will be most fitted to observe, or most likely to invent. They are, therefore, essentially rules of self-education, which is a different thing from Logic. They do not teach how to do the thing, but how to make ourselves capable of doing it. They are an art of strengthening the limbs, not an art of using them.

The extent and minuteness of observation which may be requisite, and the degree of decomposition to which it may be necessary to carry the mental analysis, depend on the particular purpose in view. To ascertain the state of the whole universe at any particular moment is impossible, but would also be useless. In making chemical experiments, we do not think it necessary to note the position of the planets; because experience has shown, as a very superficial experience is sufficient to show, that in such cases that circumstance is not material to the result: and, accordingly, in the ages when men believed in the occult influences of the heavenly bodies, it might have been unphilosophical to omit ascertaining the precise condition of those bodies at the moment of the experiment. As to the degree of minuteness of the mental subdivision; if we were obliged to break down what we observe into its very simplest elements, that is, literally into single facts, it would be difficult to say where we should find them: we can hardly ever affirm that our divisions of any kind have reached the ultimate unit. But this, too, is fortunately unnecessary. The

only object of the mental separation is to suggest the requisite physical separation, so that we may either accomplish it ourselves, or seek for it in nature; and we have done enough when we have carried the subdivision as far as the point at which we are able to see what observations or experiments we require. It is only essential, at whatever point our mental decomposition of facts may for the present have stopped, that we should hold ourselves ready and able to carry it farther as occasion requires, and should not allow the freedom of our discriminating faculty to be imprisoned by the swathes and bands of ordinary classification; as was the case with all early speculative inquirers, not excepting the Greeks, to whom it hardly ever occurred that what was called by one abstract name might, in reality, be several phenomena, or that there was a possibility of decomposing the facts of the universe into any elements but those which ordinary language already recognized.

EXAMINATION OF HAMILTON.

CHAPTER XI.

THE PSYCHOLOGICAL THEORY OF THE BELIEF IN AN EXTERNAL WORLD.

I proceed to state the case of those who hold that the belief in an external world is not intuitive, but an acquired product.

This theory postulates the following psychological truths, all of which are proved by experience.

It postulates, first, that the human mind is capable of Expectation. In other words, that after having had actual sensations, we are capable of forming the conception of Possible sensations: sensations which we are not feeling at the present moment, but which we might feel, and should feel if certain conditions were present, the nature of which conditions we have, in many cases, learnt by experience.

It postulates, secondly, the laws of the Association of Ideas. So far as we are here concerned, these laws are the following: 1st. Similar phenomena tend to be thought of together. 2nd. Phenomena which have either been experienced or conceived in close contiguity to one another, tend to be thought of together.

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The contiguity is of two kinds; simultaneity, and immediate succession. Facts which have been experienced or thought of simultaneously, recall the thought of one another. Of facts which have been experienced or thought of in immediate succession, the antecedent, or the thought of it recalls the thought of the consequent, but not conversely. 3rd. Associations produced by contiguity become more certain and rapid by repetition. When two phenomena have been very often experienced in conjunction, and have not, in any single instance, occurred separately either in experience or in thought, there is produced between them what has been called Inseparable, or less correctly, Indissoluble Association; by which it is not meant that the association must inevitably last to the end of life—that no subsequent experience or process of thought can possibly avail to dissolve it; but only that as long as no such experience or process of thought has taken place, the association is irresistible; it is impossible for us to think the one thing disjoined from the other. 4th. When an association has acquired this character of inseparability—when the bond between the two ideas has been thus firmly riveted, not only does the idea called up by association become, in our consciousness, inseparable from the idea which suggested it, but the facts or phenomena answering to those ideas, come at last to seem inseparable in existence: things which we are unable to conceive apart, appear incapable of existing apart; and the belief we have in their co-existence, though really a product of experience, seems intuitive. Innumerable examples might be given of this law. One of the most familiar, as well as the most striking, is that of our acquired perceptions of sight. Even those who, with Mr. Bailey, consider the perception of distance by the eye as not acquired, but intuitive, admit that there are many perceptions of sight which, though instantaneous and unhesitating, are not intuitive. What we see is a very minute fragment of what we think we see. We see artificially that one thing is hard, another soft. We see artificially that one thing is hot, another cold. We see artificially that what we see is a book, or a stone, each of these being not merely an inference, but a heap of inferences, from the signs which we see, to things not visible.

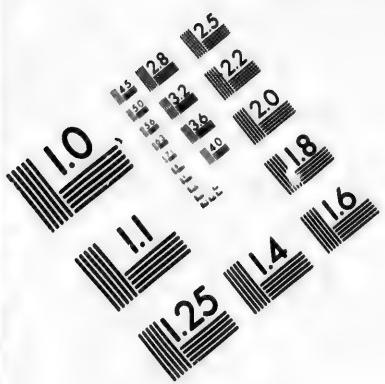
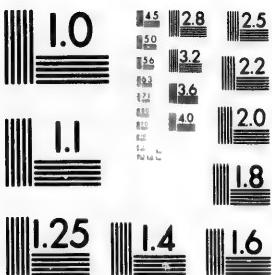
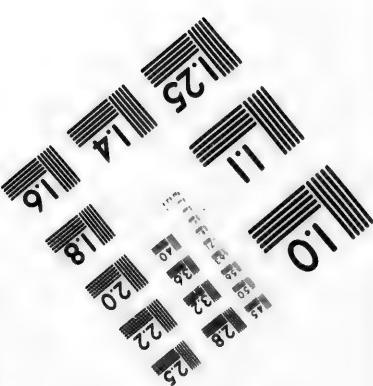
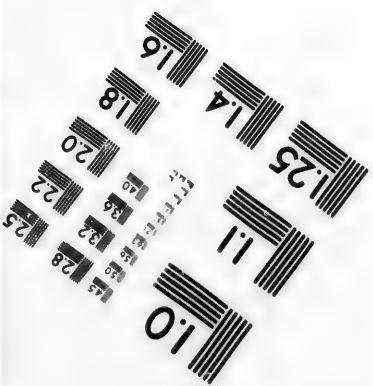


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Setting out from these premises, the Psychological Theory maintains, that there are associations naturally and even necessarily generated by the order of our sensations and of our reminiscences of sensation, which, supposing no intuition of an external world to have existed in consciousness, would inevitably generate the belief, and would cause it to be regarded as an intuition.

What is it we mean when we say that the object we perceive is external to us, and not a part of our own thoughts? We mean, that there is in our perceptions something which exists when we are not thinking of it; which existed before we had ever thought of it, and would exist if we were annihilated; and further, that there exist things which we never saw, touched, or otherwise perceived, and things which never have been perceived by man. This idea of something which is distinguished from our fleeting impressions by what, in Kantian language, is called Perdurability; something which is fixed and the same, while our impressions vary; something which exists whether we are aware of it or not, and which is always square (or of some other given figure) whether it appears to us square or round, constitutes altogether our idea of external substance. Whoever can assign an origin to this complex conception, has accounted for what we mean by the belief in matter. Now, all this, according to the Psychological Theory, is but the form impressed by the known laws of association, upon the conception or notion, obtained by experience, of Contingent Sensations; by which are meant, sensations that are not in our present consciousness, and perhaps never were in our consciousness at all, but which, in virtue of the laws to which we have learned by experience that our sensations are subject, we know that we should have felt under given supposable circumstances, and under these same circumstances, might still feel.

I see a piece of white paper on a table. I go into another room, and though I have ceased to see it, I am persuaded that the paper is still there. I no longer have the sensations which it gave me; but I believe that when I again place myself in the circumstances in which I had those sensations, that is, when I go again into the room, I shall again have them; and further, that there has been

no intervening moment at which this would not have been the case. Owing to this law of my mind, my conception of the world at any given instant consists, in only a small proportion, of present sensations. Of these I may at the time have none at all, and they are in any case a most insignificant portion of the whole which I apprehend. The conception I form of the world existing at any moment, comprises, along with the sensations I am feeling, a countless variety of possibilities of sensation; namely, the whole of those which past observation tells me that I could, under any supposable circumstances, experience at this moment, together with an indefinite and illimitable multitude of others which though I do not know that I could, yet it is possible that I might, experience in circumstances not known to me. These various possibilities are the important thing to me in the world. My present sensations are generally of little importance, and are moreover fugitive: the possibilities, on the contrary, are permanent, which is the character that mainly distinguishes our idea of Substance or Matter from our notion of sensation. These possibilities, which are conditional certainties, need a special name to distinguish them from mere vague possibilities, which experience gives no warrant for reckoning upon. Now, as soon as a distinguishing name is given, though it be only to the same thing regarded in a different aspect, one of the most familiar experiences of our mental nature teaches us, that the different name comes to be considered as the name of a different thing.

There is another important peculiarity of these certified or guaranteed possibilities of sensation; namely, that they have reference, not to single sensations, but to sensations joined together in groups. When we think of anything as a material substance, or body, we either have had, or we think that on some given supposition we should have, not some *one* sensation, but a great and even an indefinite number and variety of sensations, generally belonging to different senses, but so linked together, that the presence of one announces the possible presence at the very same instant of any or all of the rest. In our mind, therefore, not only is this particular Possibility of sensation invested with the quality of permanence when we are not actually *feeling* any of the sen-

sations at all; but when we are feeling some of them, the remaining sensations of the group are conceived by us in the form of Present Possibilities, which might be realized at the very moment. And as this happens in turn to all of them, the group as a whole presents itself to the mind as permanent, in contrast not solely with the temporariness of my bodily presence, but also with the temporary character of each of the sensations composing the group; in other words, as a kind of permanent substratum, under a set of passing experiences or manifestations: which is another leading character of our idea of substance or matter, as distinguished from sensation.

Let us now take into consideration another of the general characters of our experience, namely, that in addition to fixed groups, we also recognize a fixed Order in our sensations; an Order of succession, which, when ascertained by observation, gives rise to the ideas of Cause and Effect, according to what I hold to be the true theory of that relation, and is in any case the source of all our knowledge *what* causes produce what effects. Now, of what nature is this fixed order among our sensations? It is a constancy of antecedence and sequence. But the constant antecedence and sequence do not generally exist between one actual sensation and another. Very few such sequences are presented to us by experience. In almost all the constant sequences which occur in Nature, the antecedence and consequence do not obtain between sensations, but between the groups we have been speaking about, of which a very small portion is actual sensation, the greater part being permanent possibilities of sensation, evidenced to us by a small and variable number of sensations actually present. Hence, our ideas of causation, power, activity, do not become connected in thought with our sensations as *actual* at all, save in the few physiological cases where these figure by themselves as the antecedents in some uniform sequence. Those ideas become connected, not with sensations, but with groups of possibilities of sensation. The sensations conceived do not, to our habitual thoughts, present themselves as sensations actually experienced, inasmuch as not only any one or any number of them may be supposed absent, but none of them need be present. We

find that the modifications which are taking place more or less regularly in our possibilities of sensation, are mostly quite independent of our consciousness, and of our presence or absence. Whether we are asleep or awake, the fire goes out, and puts an end to one particular possibility of warmth and light. Whether we are present or absent, the corn ripens, and brings a new possibility of food. Hence we speedily learn to think of Nature as made up solely of these groups of possibilities, and the active force in Nature as manifested in the modification of some of these by others. The sensations, though the original foundation of the whole, come to be looked upon as a sort of accident depending on us, and the possibilities as much more real than the actual sensations, nay, as the very realities of which these are only the representations, appearances, or effects. When this state of mind has been arrived at, then, and from that time forward, we are never conscious of a present sensation without instantaneously referring it to some one of the groups of possibilities into which a sensation of that particular description enters; and if we do not yet know to what group to refer it, we at least feel an irresistible conviction that it must belong to some group or other; *i.e.* that its presence proves the existence, here and now, of a great number and variety of possibilities of sensation, without which it would not have been. The whole set of sensations as possible, form a permanent background to any one or more of them that are, at a given moment, actual; and the possibilities are conceived as standing to the actual sensations in the relation of a cause to its effects, or of canvas to the figures painted on it, or of a root to the trunk, leaves and flowers, or of a substratum to that which is spread over it, or, intranscendental language, of Matter to Form.

When this point has been reached, the permanent Possibilities in question have assumed such unlikeness of aspect, and such difference of position relatively to us, from any sensations, that it would be contrary to all we know of the constitution of human nature that they should not be conceived as, and believed to be, at least as different from sensations as sensations are from one another. Their groundwork in sensation is forgotten, and they are supposed to be something intrinsically distinct from it. We

can withdraw ourselves from any of our (external) sensations, or we can be withdrawn from them by some other agency. But though the sensations cease, the possibilities remain in existence; they are independent of our will, our presence, and everything which belongs to us. We find, too, that they belong as much to other human or sentient beings as to ourselves. We find other people grounding their expectations and conduct upon the same permanent possibilities on which we ground ours. But we do not find them experiencing the same actual sensations. Other people do not have our sensations exactly when and as we have them: but they have our possibilities of sensation; whatever indicates a present possibility of sensations to ourselves, indicates a present possibility of similar sensations to them, except so far as their organs of sensation may vary from the type of ours. This puts the final seal to our conception of the groups of possibilities as the fundamental reality in Nature. The permanent possibilities are common to us and to our fellow-creatures; the actual sensations are not. That which other people become aware of when, and on the same grounds as I do, seems more real to me than that which they do not know of unless I tell them. The world of Possible sensations succeeding one another according to laws, is as much in other beings as it is in me; it has therefore an existence outside me; it is an External World.

Matter, then, may be defined, a Permanent Possibility of Sensation. If I am asked, whether I believe in matter, I ask whether the questioner accepts this definition of it. If he does, I believe in matter: and so do all Berkeleians. In any other sense than this, I do not. But I affirm with confidence, that this conception of Matter includes the whole meaning attached to it by the common world, apart from philosophical, and sometimes from theological, theories. The reliance of mankind on the real existence of visible and tangible objects, means reliance on the reality and permanence of Possibilities of visual and tactual sensations, when no such sensations are actually experienced. We are warranted in believing that this is the meaning of Matter in the minds of many of its most esteemed metaphysical champions, though they themselves would not admit as much; for example,

of Reid, Stewart, and Brown. For these three philosophers alleged that all mankind, including Berkeley and Hume, really believed in Matter, inasmuch as unless they did, they would not have turned aside to save themselves from running against a post. Now, all which this manoeuvre really proved is, that they believed in Permanent Possibilities of Sensation. We have therefore the sanction of these three eminent defenders of the existence of matter, for affirming, that to believe in Permanent Possibilities of Sensation, is believing in Matter. It is hardly necessary, after such authorities, to mention Dr. Johnson, or any one else who resorts to the *argumentum baculinum* of knocking a stick against the ground. Sir W. Hamilton, a far subtler thinker than any of these, never reasons in this manner. He never supposes that a disbeliever in what he means by Matter, ought in consistency to act in any different mode from those who believe in it. He knew that the belief on which all the practical consequences depend, is the belief in Permanent Possibilities of Sensation, and that if nobody believed in a material universe in any other sense, life would go on exactly as it now does. He, however, did believe in more than this, but, I think, only because it had never occurred to him that mere Possibilities of Sensation could, to our artificialized consciousness, present the character of objectivity which, as we have now shown, they not only can, but unless the known laws of the human mind were suspended, must necessarily, present.

Perhaps it may be objected, that the very possibility of framing such a notion of Matter as Sir W. Hamilton's—the capacity in the human mind of imagining an external world which is anything more than what the Psychological Theory makes it—amounts to a disproof of the theory. If (it may be said) we had no revelation in consciousness, of a world which is not in some way or other identified with sensation, we should be unable to have the notion of such a world. If the only ideas we had of external objects were ideas of our sensations, supplemented by an acquired notion of permanent possibilities of sensation, we must (it is thought) be incapable of conceiving, and therefore still more incapable of fancying that we perceive, things which

are not sensations at all. It being evident, however, that some philosophers believe this, and it being maintainable that the mass of mankind do so, the existence of a perdurable basis of sensations, distinct from sensations themselves, is proved, it might be said, by the possibility of believing it.

Let me first restate what I apprehend the belief to be. We believe that we perceive a something closely related to all our sensations, but different from those which we are feeling at any particular minute; and distinguished from sensations altogether, by being permanent and always the same, while these are fugitive, variable, and alternately displace one another. But these attributes of the object of perception are properties belonging to all the possibilities of sensation which experience guarantees. The belief in such permanent possibilities seems to me to include all that is essential or characteristic in the belief in substance. I believe that Calcutta exists, though I do not perceive it, and that it would still exist if every percipient inhabitant were suddenly to leave the place, or be struck dead. But when I analyze the belief, all I find in it is, that were these events to take place, the Permanent Possibility of Sensation which I call Calcutta would still remain; that if I were suddenly transported to the banks of the Hoogly, I should still have the sensations which, if now present, would lead me to affirm that Calcutta exists here and now. We may infer, therefore, that both philosophers and the world at large, when they think of matter, conceive it really as a Permanent Possibility of Sensation. But the majority of philosophers fancy that it is something more; and the world at large, though they have really, as I conceive, nothing in their minds but a Permanent Possibility of Sensation, would, if asked the question, undoubtedly agree with the philosophers: and though this is sufficiently explained by the tendency of the human mind to infer difference of things from difference of names, I acknowledge the obligation of showing how it can be possible to believe in an existence transcending all possibilities of sensation, unless on the hypothesis that such an existence actually is, and that we actually perceive it.

The explanation, however, is not difficult. It is an admitted fact, that we are capable of all conceptions which can be formed

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by generalizing from the observed laws of our sensations. Whatever relation we find to exist between any one of our sensations and something different from *it*, that same relation we have no difficulty in conceiving to exist between the sum of all our sensations and something different from *them*. The differences which our consciousness recognizes between one sensation and another, give us the general notion of difference, and inseparably associate with every sensation we have, the feeling of its being different from other things; and when once this association has been formed, we can no longer conceive anything, without being able, and even being compelled, to form also the conception of something different from it. This familiarity with the idea of something different from *each* thing we know, makes it natural and easy to form the notion of something different from *all* things that we know, collectively as well as individually. It is true we can form no conception of what such a thing can be; our notion of it is merely negative; but the idea of substance, apart from the impressions it makes on our senses, is a merely negative one. There is thus no psychological obstacle to our forming the notion of a something which is neither a sensation nor a possibility of sensation, even if our consciousness does not testify to it; and nothing is more likely than that the Permanent Possibilities of sensation, to which our consciousness does testify, should be confounded in our minds with this imaginary conception. All experience attests the strength of the tendency to mistake mental abstractions, even negative ones, for substantive realities; and the Permanent Possibilities of sensation which experience guarantees, are so extremely unlike in many of their properties to actual sensations, that since we are capable of imagining something which transcends sensation, there is a great natural probability that we should suppose these to be it.

But this natural probability is converted into certainty, when we take into consideration that universal law of our experience which is termed the law of Causation, and which makes us unable to conceive the beginning of anything without an antecedent condition, or Cause. The case of Causation is one of the most marked of all the cases in which we extend to the sum total of

our consciousness, a notion derived from its parts. It is a striking example of our power to conceive, and our tendency to believe, that a relation which subsists between every individual item of our experience and some other item, subsists also between our experience as a whole, and something not within the sphere of experience. By this extension to the sum of all our experiences, of the internal relations obtaining between its several parts, we are led to consider sensation itself—the aggregate whole of our sensations—as deriving its origin from antecedent existences transcending sensation. That we should do this, is a consequence of the particular character of the uniform sequences, which experience discloses to us among our sensations. As already remarked, the constant antecedent of a sensation is seldom another sensation, or set of sensations, actually felt. It is much oftener the existence of a group of possibilities, not necessarily including any actual sensations, except such as are required to show that the possibilities are really present. Nor are actual sensations indispensable even for this purpose; for the presence of the object (which is nothing more than the immediate presence of the possibilities) may be made known to us by the very sensation which we refer to it as its effect. Thus, the real antecedent of an effect—the only antecedent which, being invariable and unconditional, we consider to be the cause—may be, not any sensation really felt, but solely the presence, at that or the immediately preceding moment, of a group of possibilities of sensation. Hence it is not with sensations as actually experienced, but with their Permanent Possibilities, that the idea of Cause comes to be identified: and we, by one and the same process, acquire the habit of regarding Sensation in general, like all our individual sensations, as an Effect, and also that of conceiving as the causes of most of our individual sensations, not other sensations, but general possibilities of sensation. If all these considerations put together do not completely explain and account for our conceiving these Possibilities as a class of independent and substantive entities, I know not what psychological analysis can be conclusive.

It may perhaps be said, that the preceding theory gives, indeed, some account of the idea of Permanent Existence which forms

part of our conception of matter, but gives no explanation of our believing these permanent objects to be external, or out of ourselves. I apprehend, on the contrary, that the very idea of anything out of ourselves is derived solely from the knowledge experience gives us of the Permanent Possibilities. Our sensations we carry with us wherever we go, and they never exist where we are not; but when we change our place we do not carry away with us the Permanent Possibilities of Sensation: they remain until we return, or arise and cease under conditions with which our presence has in general nothing to do. And more than all—they are, and will be after we have ceased to feel, Permanent Possibilities of sensation to other beings than ourselves. Thus our actual sensations and the permanent possibilities of sensation, stand out in obtrusive contrast to one another: and when the idea of Cause has been acquired, and extended by generalization from the parts of our experience to its aggregate whole, nothing can be more natural than that the Permanent Possibilities should be classed by us as existences generically distinct from our sensations, but of which our sensations are the effect.

The same theory which accounts for our ascribing to an aggregate of possibilities of sensation, a permanent existence which our sensations themselves do not possess, and consequently a greater reality than belongs to our sensations, also explains our attributing greater objectivity to the Primary Qualities of bodies than to the Secondary. For the sensations which correspond to what are called the Primary Qualities (as soon at least as we come to apprehend them by two senses, the eye as well as the touch) are always present when any part of the group is so. But colours, tastes, smells and the like, being, in comparison, fugacious, are not, in the same degree, conceived as being always there, even when nobody is present to perceive them. The sensations answering to the Secondary Qualities are only occasional, those to the Primary, constant. The Secondary, moreover, vary with different persons, and with the temporary sensibility of our organs: the Primary, when perceived at all, are, as far as we know, the same to all persons and at all times.

CHAPTER XII.

THE PSYCHOLOGICAL THEORY OF THE BELIEF IN MATTER,
HOW FAR APPLICABLE TO MIND.

I now propose to examine whether the Ego, as a deliverance of consciousness, stands on any firmer ground than the Non-ego; whether, at the first moment of our experience, we already have in our consciousness the conception of Self as a permanent existence; or whether it is formed subsequently, and admits of a similar analysis to that which we have found that the notion of Not-self is susceptible of.

It is evident, in the first place, that our knowledge of mind, like that of matter, is entirely relative. We have no conception of Mind itself, as distinguished from its conscious manifestations. We neither know nor can imagine it, except as represented by the succession of manifold feelings which metaphysicians call by the name of States or Modifications of Mind. It is nevertheless true that our notion of Mind, as well as of Matter, is the notion of a permanent something, contrasted with the perpetual flux of the sensations and other feelings or mental states which we refer to it; a something which we figure as remaining the same, while the particular feelings through which it reveals its existence, change. This attribute of Permanence, supposing that there were nothing else to be considered, would admit of the same explanation when predicated of Mind, as of Matter. The belief I entertain that my mind exists, when it is not feeling, nor thinking, nor conscious of its own existence, resolves itself into the belief of a Permanent Possibility of these states. If I think of myself as in a dreamless sleep, or in the sleep of death, and believe that I, or in other words my mind, is or will be existing through these states, though not in conscious feeling, the most scrupulous examination of my belief will not detect in it any fact actually believed, except that my capability of feeling is not, in that interval, permanently destroyed, and is suspended only because it does not meet with the combination of outward circumstances which would call it into action; the moment it did meet with that combination it would revive, and remains, therefore, a Permanent

Possibility. Thus far, there seems no hindrance to our regarding Mind as nothing but the series of our sensations (to which must now be added our internal feelings), as they actually occur, with the addition of infinite possibilities of feeling requiring for their actual realization conditions which may or may not take place, but which as possibilities are always in existence, and many of them present.

The Permanent Possibility of feeling, which forms my notion of Myself, is distinguished, by important differences, from the Permanent Possibilities of sensation which form my notion of what I call external objects. In the first place, each of these last represents a small and perfectly definite part of the series which, in its entirety, forms my conscious existence—a single group of possible sensations, which experience tells me I might expect to have under certain conditions; as distinguished from mere vague and indefinite possibilities, which are considered such only because they are not known to be impossibilities. My notion of Myself, on the contrary, includes all possibilities of sensation, definite or indefinite, certified by experience or not, which I may imagine inserted in the series of my actual and conscious states. In the second place, the Permanent Possibilities which I call outward objects, are possibilities of sensation only, while the series which I call Myself includes, along with and as called up by these, thoughts, emotions, and volitions, and Permanent Possibilities of such. Besides that these states of mind are, to our consciousness, generically distinct from the sensations of our outward senses, they are further distinguished from them by not occurring in groups, consisting of separate elements which coexist, or may be made to coexist, with one another. Lastly (and this difference is the most important of all) the Possibilities of Sensation which are called outward objects, are possibilities of it to other beings as well as to me: but the particular series of feelings which constitutes my own life, is confined to myself: no other sentient being shares it with me.

In order to the further understanding of the bearings of this theory of the Ego, it is advisable to consider it in its relation to three questions, which may very naturally be asked with reference

to it, and which often have been asked, and sometimes answered very erroneously. If the theory is correct, and my Mind is but a series of feelings, or, as it has been called, a thread of consciousness, however supplemented by believed Possibilities of consciousness which are not, though they might be, realized; if this is all that Mind, or Myself, amounts to, what evidence have I (it is asked) of the existence of my fellow-creatures? What evidence of an hyper-physical world, or, in one word, of God? and lastly, what evidence of immortality?

Dr. Reid unhesitatingly answers, None. If the doctrine is true, I am alone in the universe.

I hold this to be one of Reid's most palpable mistakes. Whatever evidence to each of the three points there is on the ordinary theory, exactly that same evidence is there on this.

In the first place, as to my fellow-creatures. Reid seems to have imagined that if I myself am only a series of feelings, the proposition that I have any fellow-creatures, or that there are any Selves, except mine, is but words without a meaning. But this is a misapprehension. All that I am compelled to admit if I receive this theory, is that other people's Selves also are but a series of feelings, like my own. Though my Mind, as I am capable of conceiving it, be nothing but the succession of my feelings, and though Mind itself may be merely a possibility of feelings, there is nothing in that doctrine to prevent my conceiving, and believing, that there are other successions of feelings besides those of which I am conscious, and that these are as real as my own. The belief is completely consistent with the metaphysical theory. Let us now see whether the theory takes away the grounds of it.

What are those grounds? By what evidence do I know, or by what considerations am I led to believe, that there exist other sentient creatures; that the walking and speaking figures which I see and hear, have sensations and thoughts, or, in other words, possess Minds? The most strenuous Intuitionist does not include this among the things that I know by direct intuition. I conclude it from certain things, which my experience of my own states of feeling proves to me to be marks of it. These marks are of two kinds, antecedent and subsequent; the previous con-

ditions requisite for feeling, and the effects or consequences of it. I conclude that other human beings have feelings like me, because, first, they have bodies like me, which I know, in my own case, to be the antecedent condition of feelings; and because, secondly, they exhibit the acts, and other outward signs, which in my own case I know by experience to be caused by feelings. I am conscious in myself of a series of facts connected by a uniform sequence, of which the beginning is modifications of my body, the middle is feelings, the end is outward demeanour. In the case of other human beings I have the evidence of my senses for the first and last links of the series, but not for the intermediate link. I find, however, that the sequence between the first and last is as regular and constant in those other cases as it is in mine. In my own case I know that the first link produces the last through the intermediate link, and could not produce it without. Experience, therefore, obliges me to conclude that there must be an intermediate link; which must either be the same in others as in myself, or a different one: I must either believe them to be alive, or to be automatons: and by believing them to be alive, that is, by supposing the link to be of the same nature as in the case of which I have experience, and which is in all other respects similar, I bring other human beings, as phenomena, under the same generalizations which I know by experience to be the true theory of my own existence. And in doing so I conform to the legitimate rules of experimental inquiry. The process is exactly parallel to that by which Newton proved that the force which keeps the planets in their orbits is identical with that by which an apple falls to the ground. It was not incumbent on Newton to prove the impossibility of its being any other force; he was thought to have made out his point when he had simply shown, that no other force need be supposed. We know the existence of other beings by generalization from the knowledge of our own; the generalization merely postulates that what experience shows to be a mark of the existence of something within the sphere of our consciousness, may be concluded to be a mark of the same thing beyond that sphere.

This logical process loses none of its legitimacy on the suppo-

sition that neither Mind nor Matter is anything but a permanent possibility of feeling. Whatever sensation I have, I at once refer it to one of the permanent groups of possibilities of sensation which I call material objects. But among these groups I find there is one (my own body) which is not only composed, like the rest, of a mixed multitude of sensations and possibilities of sensations, but is also connected, in a peculiar manner, with all my sensations. Not only is this special group always present as an antecedent condition of every sensation I have, but the other groups are only enabled to convert their respective possibilities of sensation into actual sensations, by means of some previous change in that particular one. I look about me, and though there is only one group (or body) which is connected with all my sensations in this peculiar manner, I observe that there is a great multitude of other bodies, closely resembling in their sensible properties (in the sensations composing them as groups) this particular one, but whose modifications do not call up, as those of my own body do, a world of sensations in my consciousness. Since they do not do so in my consciousness, I infer that they do it out of my consciousness, and that to each of them belongs a world of consciousness of its own, to which it stands in the same relation in which what I call my own body stands to mine. And having made this generalization, I find that all other facts within my reach agree with it. Each of these bodies exhibits to my senses a set of phenomena (composed of acts and other manifestations) such as I know, in my own case, to be effects of consciousness, and such as might be looked for if each of the bodies has really in connection with it a world of consciousness. All this is as good and genuine an inductive process on the theory we are discussing, as it is on the common theory. Any objection to it in the one case would be an equal objection in the other. I have stated the postulate required by the one theory: the common theory is in need of the same. If I could not, from my personal knowledge of one succession of feelings, infer the existence of other successions of feelings, when manifested by the same outward signs, I could just as little, from my personal knowledge of a single spiritual substance, infer by generalization, when I find the same outward indications, the existence of other spiritual substances.

As the theory leaves the evidence of the existence of my fellow-creatures exactly as it was before, so does it also with that of the existence of God. Supposing me to believe that the Divine Mind is simply the series of the Divine thoughts and feelings prolonged through eternity, that would be, at any rate, believing God's existence to be as real as my own. And as for evidence, the argument of Paley's Natural Theology, or, for that matter, of his Evidences of Christianity, would stand exactly where it does. The Design argument is drawn from the analogy of human experience. From the relation which human works bear to human thoughts and feelings, it infers a corresponding relation between works, more or less similar but superhuman, and superhuman thoughts and feelings. If it proves these, nobody but a metaphysician needs care whether or not it proves a mysterious substratum for them. Again, the arguments for Revelation undertake to prove by testimony, that within the sphere of human experience works were done requiring a greater than human power, and words said requiring a greater than human wisdom. These positions, and the evidences of them, neither lose nor gain anything by our supposing that the wisdom only means wise thoughts and volitions, and that the power means thoughts and volitions followed by imposing phenomena.

As to Immortality, it is precisely as easy to conceive, that a secession of feelings, a thread of consciousness, may be prolonged to eternity, as that a spiritual substance forever continues to exist: and any evidence which would prove the one, will prove the other. Metaphysical theologians may lose the *a priori* argument by which they have sometimes flattered themselves with having proved that a spiritual substance, by the essential constitution of its nature, *cannot* perish. But they had better drop this argument in any case. To do them justice, they seldom insist on it now.

The theory, therefore, which resolves Mind into a series of feelings, with a background of possibilities of feeling, can effectually withstand the most invidious of the arguments directed against it. But, groundless as are the extrinsic objections, the theory has intrinsic difficulties which we have not yet set forth,

and which it seems to me beyond the power of metaphysical analysis to remove. Besides present feelings, and possibilities of present feeling, there is another class of phenomena to be included in an enumeration of the elements making up our conception of Mind. The thread of consciousness which composes the mind's phenomenal life, consists not only of present sensations, but likewise, in part, of memories and expectations. Now, what are these? In themselves, they are present feelings, states of present consciousness, and in that respect not distinguished from sensations. They all, moreover, resemble some given sensations or feelings, of which we have previously had experience. But they are attended with the peculiarity, that each of them involves a belief in more than its own present existence. A sensation involves only this: but a remembrance of sensation, even if not referred to any particular date, involves the suggestion and belief that a sensation, of which it is a copy or representation, actually existed in the past: and an expectation involves the belief, more or less positive, that a sensation or other feeling to which it directly refers, will exist in the future. Nor can the phenomena involved in these two states of consciousness be adequately expressed, without saying, that the belief they include is, that I myself formerly had, or that I myself, and no other, shall hereafter have, the sensations remembered or expected. The fact believed is, that the sensations did actually form, or will hereafter form, part of the self-same series of states, or thread of consciousness, of which the remembrance or expectation of those sensations is the part now present. If, therefore, we speak of the Mind as a series of feelings, we are obliged to complete the statement by calling it a series of feelings which is aware of itself as past and future; and we are reduced to the alternative of believing that the Mind, or Ego, is something different from any series of feelings, or possibilities of them, or of accepting the paradox, that something which *ex hypothesi* is but a series of feelings, can be aware of itself as a series.

The truth is, that we are here face to face with that final inexplicability, at which, as Sir W. Hamilton observes, we inevitably arrive when we reach ultimate facts; and in general, one

mode of stating it only appears more incomprehensible than another, because the whole of human language is accommodated to the one, and is so incongruous with the other, that it cannot be expressed in any terms which do not deny its truth. The real stumbling block is perhaps not in any theory of the fact, but in the fact itself. The true incomprehensibility perhaps is, that something which has ceased, or is not yet in existence, can still be in a manner present: that a series of feelings, the infinitely greater part of which is past or future, can be gathered up, as it were, into a single present conception, accompanied by a belief of reality. I think, by far the wisest thing we can do, is to accept the inexplicable fact, without any theory of how it takes place; and when we are obliged to speak of it in terms which assume a theory, to use them with a reservation as to their meaning.

CHAPTER XXVI.

ON THE FREEDOM OF THE WILL.

To be conscious of free-will, must mean, to be conscious, before I have decided, that I am able to decide either way. Exception may be taken *in limine* to the use of the word consciousness in such an application. Consciousness tells me what I do or feel. But what I am *able* to do, is not a subject of consciousness. Consciousness is not prophetic; we are conscious of what is, not of what will or can be. We never know that we are able to do a thing, except from having done it, or something equal and similar to it. We should not know that we were capable of action at all, if we had never acted. Having acted, we know, as far as that experience reaches, how we are able to act; and this knowledge, when it has become familiar, is often confounded with, and called by the name of, consciousness. But it does not derive any increase of authority from being mis-named; its truth is not supreme over, but depends on, experience. If our so-called consciousness of what we are able to do is not borne out by experience, it is a delusion. It has no title to credence but as an interpretation of experience, and if it is a false interpretation, it must give way.

But this conviction, whether termed consciousness or only belief, that our will is free—what is it? Of what are we convinced? I am told, that whether I decide to do or to abstain, I feel that I could have decided the other way. I ask my consciousness what I do feel, and I find, indeed, that I feel (or am convinced) that I could have chosen the other course *if I had preferred it*; but not that I could have chosen one course while I preferred the other. When I say preferred, I of course include with the thing itself, all that accompanies it. I know that I can, because I know that I often do, elect to do one thing, when I should have preferred another in itself, apart from its consequences, or from a moral law which it violates. And this preference for a thing in itself, abstractedly from its accompaniments, is often loosely described as preference for the thing. It is this unprecise mode of speech which makes it not seem absurd to say that I act in opposition to my preference; that I do one thing when I would rather do another; that my conscience prevails over my desires—as if conscience were not itself a desire—the desire to do right. Take any alternative: say, to murder or not to murder. I am told, that if I elect to murder, I am conscious that I could have elected to abstain: but am I conscious that I could have abstained, if my aversion to the crime, and my dread of its consequences, had been weaker than the temptation? If I elect to abstain: in what sense am I conscious that I could have elected to commit the crime? Only if I had desired to commit it with a desire stronger than my horror of murder; not with one less strong. When we think of ourselves hypothetically as having acted otherwise than we did, we always suppose a difference in the antecedents: we picture ourselves as having known something that we did not know, or not known something that we did know; which is a difference in the external motives; or as having desired something, or disliked something, more or less than we did; which is a difference in the internal motives.

I therefore dispute altogether that we are conscious of being able to act in opposition to the strongest present desire or aversion. The difference between a bad and a good man is not that the latter acts in opposition to his strongest desires: it is that his desire to do right, and his aversion to doing wrong, are strong

enough to overcome, and in the case of perfect virtue, to silence, any other desire or aversion which may conflict with them. It is because this state of mind is possible to human nature, that human beings are capable of moral government: and moral education consists in subjecting them to the discipline which has most tendency to bring them into this state. The object of moral education is to educate the will: but the will can only be educated through the desires and aversions; by eradicating or weakening such of them as are likeliest to lead to evil; exalting to the highest pitch the desire of right conduct and the aversion to wrong; cultivating all other desires and aversions of which the ordinary operation is auxilliary to right, while discountenancing so immoderate an indulgence of them, as might render them too powerful to be overcome by the moral sentiment, when they chance to be in opposition to it. The other requisites are, a clear intellectual standard of right and wrong, that moral desire and aversion may act in the proper places, and such general mental habits as shall prevent moral considerations from being forgotten or overlooked, in cases to which they are rightly applicable.

Rejecting, then, the figment of a direct consciousness of the freedom of the will, in other words, our ability to will in opposition to our strongest preference; it remains to consider whether, as affirmed by Sir W. Hamilton, a freedom of this kind is implied in what is called our consciousness of moral responsibility. There must be something very plausible in this opinion, since it is shared even by Necessitarians. Many of these—in particular Mr. Owen and his followers—from a recognition of the fact that volitions are effects of causes, have been led to deny human responsibility. I do not mean that they denied moral distinctions. Few persons have had a stronger sense of right and wrong, or been more devoted to the things they deemed right. What they denied was the rightfulness of inflicting punishment. A man's actions, they said, are the result of his character, and he is not the author of his own character. It is made *for* him, not *by* him. There is no justice in punishing him for what he cannot help. We should try to convince or persuade him that he had better act in a different manner; and should educate all, especially the

young, in the habits and dispositions which lead to well-doing; though how this is to be effected without any use whatever of punishment as a means of education, is a question they have failed to resolve. The confusion of ideas, which makes the subjection of human volitions to the law of Causation seem inconsistent with accountability, must thus be very natural to the human mind; but this may be said of a thousand errors, and even of some merely verbal fallacies. In the present case there is more than a verbal fallacy, but verbal fallacies also contribute their part.

What is meant by moral responsibility? Responsibility means punishment. When we are said to have the feeling of being morally responsible for our actions, the idea of being punished for them is uppermost in the speaker's mind. But the feeling of liability to punishment is of two kinds. It may mean, expectation that if we act in a certain manner, punishment will actually be inflicted upon us, by our fellow-creatures or by a Supreme Power. Or it may only mean, being conscious that we shall deserve that infliction.

The first of these cannot, in any correct meaning of the term, be designated as a consciousness. If we believe that we shall be punished for doing wrong, it is because the belief has been taught to us by our parents and tutors, or by our religion, or is generally held by those who surround us, or because we have ourselves come to the conclusion by reasoning, or from the experience of life. This is not Consciousness. And, by whatever name it is called, its evidence is not dependent on any theory of the spontaneousness of volition. The punishment of guilt in another world is believed with undoubting conviction by Turkish fatalists, and by professed Christians who are not only Necessitarians, but believe that the majority of mankind were divinely predestined from all eternity to sin and to be punished for sinning. It is not, therefore, the belief that we shall be *made* accountable, which can be deemed to require or pre-suppose the free-will hypothesis; it is the belief that we ought so to be; that we are justly accountable; that guilt deserves punishment. It is here that the main issue is joined between the two opinions.

In discussing it, there is no need to postulate any theory respecting the nature or criterion of moral distinctions. It matters not, for this purpose, whether the right and wrong of actions depends on the consequences they tend to produce, or on an inherent quality of the actions themselves. It is indifferent whether we are utilitarians or anti-utilitarians; whether our ethics rest on intuition or on experience. It is sufficient if we believe that there is a difference between right and wrong, and a natural reason for preferring the former; that people in general, unless when they expect personal benefit from a wrong, naturally and usually prefer what they think to be right: whether because we are all dependent for what makes existence tolerable, upon the right conduct of other people, while their wrong conduct is a standing menace to our security, or for some more mystical and transcendental reason. Whatever be the cause, we are entitled to assume the fact; and its consequence is, that whoever cultivates a disposition to wrong, places his mind out of sympathy with the rest of his fellow-creatures, and if they are aware of his disposition, becomes a natural object of their active dislike. He not only forfeits the pleasure of their good will, and the benefit of their good offices, except when compassion for the human being is stronger than distaste towards the wrong-doer; but he also renders himself liable to whatever they may think it necessary to do in order to protect themselves against him; which may probably include punishment, as such, and will certainly involve much that is equivalent in its operation on himself. In this way he is certain to be made accountable, at least to his fellow-creatures, through the normal action of their natural sentiments. And it is well worth consideration, whether the practical expectation of being thus called to account, has not a great deal to do with the internal feeling of being accountable; a feeling, assuredly, which is seldom found existing in any strength in the absence of that practical expectation. It is not usually found that Oriental despots, who cannot be called to account by anybody, have much consciousness of being morally accountable. And (what is still more significant) in societies in which caste or class distinctions are really strong—a state so strange to us now, that we seldom realize it in its full

force—it is a matter of daily experience that persons may show the strongest sense of moral accountability as regards their equals, who can make them accountable, and not the smallest vestige of a similar feeling towards their inferiors who cannot.

Another fact which it is of importance to keep in view, is, that the highest and strongest sense of the worth of goodness, and the odiousness of its opposite, is perfectly compatible with even the most exaggerated form of Fatalism. Suppose that there were two peculiar breeds of human beings,—one of them so constituted from the beginning, that however educated or treated, nothing could prevent them from always feeling and acting so as to be a blessing to all whom they approached; another, of such original perversity of nature that neither education nor punishment could inspire them with a feeling of duty, or prevent them from being active in evil-doing. Neither of these races of human beings would have free-will; yet the former would be honored as demigods, while the latter would be regarded and treated as noxious beasts; not punished perhaps, since punishment would have no effect on them, and it might be thought wrong to indulge the mere instinct of vengeance: but kept carefully at a distance, and killed like other dangerous creatures when there was no other convenient way of being rid of them. We thus see that even under the utmost possible exaggeration of the doctrine of Necessity, the distinction between moral good and evil in conduct would not only subsist, but would stand out in a more marked manner than now, when the good and the wicked, however unlike, are still regarded as of one common nature.

But these considerations, though pertinent to the subject, do not touch the root of the difficulty. The real question is one of justice—the legitimacy of retribution, or punishment. On the theory of Necessity (we are told) man cannot help acting as he does; and it cannot be just that he should be punished for what he cannot help.

Not if the expectation of punishment enables him to help it, and is the only means by which he can be enabled to help it?

To say that he cannot help it, is true or false, according to the qualification with which the assertion is accompanied. Supposing

him to be of a vicious disposition, he cannot help doing the criminal act, if he is allowed to believe that he will be able to commit it unpunished. If, on the contrary, the impression is strong in his mind that a heavy punishment will follow, he can, and in most cases, does, help it.

The question deemed to be so puzzling is, how punishment can be justified, if men's actions are determined by motives, among which motives punishment is one. A more difficult question would be, how it can be justified if they are not so determined. Punishment proceeds on the assumption that the will is governed by motives. If punishment had no power of acting on the will, it would be illegitimate, however natural might be the inclination to inflict it. Just so far as the will is supposed free, that is, capable of acting *against* motives, punishment is disappointed of its object, and deprived of its justification.

There are two ends which, on the Necessitarian theory, are sufficient to justify punishment: the benefit of the offender himself, and the protection of others. The first justifies it, because to benefit a person cannot be to do him an injury. To punish him for his own good, provided the inflictor has any proper title to constitute himself a judge, is no more unjust than to administer medicine. As far, indeed, as respects the criminal himself, the theory of punishment is, that by counterbalancing the influence of present temptations or acquired bad habits, it restores the mind to that normal preponderance of the love of right, which the best moralists and theologians consider to constitute the true definition of our freedom. In its other aspect, punishment is a precaution taken by society in self-defence. To make this just, the only condition required is, that the end which society is attempting to enforce by punishment, should be a just one. Used as a means of aggression by society on the just rights of the individual, punishment is unjust. Used to protect the just rights of others against unjust aggression by the offender, it is just. If it is possible to have just rights, it cannot be unjust to defend them. Free-will or no free-will, it is just to punish so far as is necessary for this purpose, exactly as it is just to put a wild beast to death (without unnecessary suffering) for the same object.

Now, the primitive consciousness we are said to have, that we are accountable for our actions, and that if we violate the rule of right we shall deserve punishment, I contend is nothing else than our knowledge that punishment will be just; that by such conduct we shall place ourselves in the position in which our fellow-creatures, or the Deity, or both, will naturally, and may justly, inflict punishment upon us. By using the word *justly*, I am not assuming, in the explanation, the thing I profess to explain. As before observed, I am entitled to postulate the reality, and the knowledge and feeling, of moral distinctions. These, it is both evident metaphysically and notorious historically, are independent of any theory concerning the will. We are supposed capable of understanding that other people have rights, and all that follows from this. The mind which possesses this idea, if capable of placing itself at the point of view of another person, must recognize it as just that others should protect themselves against any disposition on his part to infringe their rights; and he will do so the more readily, because he also has rights, and his rights continually require the same protection. This, I maintain, is our feeling of accountability, in so far as it can be separated from the prospect of being actually called to account. No one who understands the power of the principle of association, can doubt its sufficiency to create out of these elements the whole of the feeling of which we are conscious. To rebut this view of the case would require positive evidence; as, for example, if it could be proved that the feeling of accountability precedes, in the order of development, all experience of punishment. No such evidence has been produced, or is producible. Owing to the limited accessibility to observation of the mental processes of infancy, direct proof can as little be produced on the other side: but if there is any validity in Sir W. Hamilton's Law of Parcimony, we ought not to assume any mental phenomenon as an ultimate fact, which can be accounted for by other known properties of our mental nature.

I ask any one who thinks that the justice of punishment is not sufficiently vindicated by its being for the protection of just rights, how he reconciles his sense of justice to the punishment of crimes committed in obedience to a perverted conscience? Ravaillac, and

Balthasar Gérard, did not regard themselves as criminals, but as heroic martyrs. If they were justly put to death, the justice of punishment has nothing to do with the state of mind of the offender, further than as this may affect the efficacy of punishment as a means to its end. It is impossible to assert the justice of punishment for crimes of fanaticism, on any other ground than its necessity for the attainment of a just end. If that is not a justification, there is no justification. All other imaginary justifications break down in their application to this case.

If, indeed, punishment is inflicted for any other reason than in order to operate on the will; if its purpose be other than that of improving the culprit himself, or securing the just rights of others against unjust violation, then, I admit, the case is totally altered. If any one thinks that there is justice in the infliction of purposeless suffering; that there is a natural affinity between the two ideas of guilt and punishment, which makes it intrinsically fitting that wherever there has been guilt, pain should be inflicted by way of retribution; I acknowledge that I can find no argument to justify punishment inflicted on this principle. As a legitimate satisfaction to feelings of indignation and resentment which are on the whole salutary and worthy of cultivation, I can in certain cases admit it; but here it is still a means to an end. The merely retributive view of punishment derives no justification from the doctrine I support. But it derives quite as little from the free-will doctrine. Suppose it true that the will of a malefactor, when he committed an offence, was free, or in other words, that he acted badly, not because he was of a bad disposition, but for no reason in particular: it is not easy to deduce from this the conclusion that it is just to punish him. That his acts were beyond the command of motives might be a good reason for keeping out of his way, or placing him under bodily restraint; but no reason for inflicting pain upon him, when that pain, by supposition, could not operate as a deterring motive.

While the doctrine I advocate does not support the idea that punishment in mere retaliation is justifiable, it at the same time fully accounts for the general and natural sentiment of its being so. From our earliest childhood, the ideas of doing wrong and

of punishment are presented to our mind together, and the intense character of the impressions causes the association between them to attain the highest degree of closeness and intimacy. Is it strange, or unlike the usual processes of the human mind, that in these circumstances we should retain the feeling, and forget the reason on which it is grounded? But why do I speak of forgetting? In most cases the reason has never, in our early education, been presented to the mind. The only ideas presented have been those of wrong and punishment, and an inseparable association has been created between these directly, without the help of any intervening idea. This is quite enough to make the spontaneous feelings of mankind regard punishment and a wrongdoer as naturally fitted to each other—as a conjunction appropriate in itself, independently of any consequences. Even Sir W. Hamilton recognises as one of the common sources of error, that “the associations of thought are mistaken for the connexions of existence.” If this is true anywhere, it is truest of all in the associations into which emotions enter. A strong feeling, directly excited by an object, is felt (except when contradicted by the feelings of other people) as its own sufficient justification—no more requiring the support of a reason than the fact that ginger is hot in the mouth; and it almost requires a philosopher, to recognize the need of a reason for his feelings, unless he has been under the practical necessity of justifying them to persons by whom they are not shared.

That a person holding what is called the Necessitarian doctrine should on that account *feel* that it would be unjust to punish him for his wrong actions, seems to me the veriest of chimeras. Yes, if he really “could not help” acting as he did, that is, if his *will* could not have helped it; if he was under physical constraint, or under the action of such a violent motive that no fear of punishment could have any effect; which, if capable of being ascertained, is a just ground of exemption, and is the reason why by the laws of most countries people are not punished for what they were compelled to do by immediate danger of death. But if the criminal was in a state capable of being operated upon by the fear of punishment, no metaphysical objection, I believe, will

make him feel his punishment unjust. Neither will he feel that because his act was the consequence of motives, operating upon a certain mental disposition, it was not his own fault. For, first, it was at all events his own defect or infirmity, for which the expectation of punishment is the appropriate cure. And secondly, the word fault, so far from being inapplicable, is the specific name for the kind of defect or infirmity which he has displayed—insufficient love of right and aversion to wrong. The weakness of these feelings or their strength is in every one's mind the standard of fault or merit, of degrees of fault and degrees of merit. Whether we are judging of particular actions, or of the character of a person, we are wholly guided by the indications afforded of the energy of these influences. If the desire of right and aversion to wrong have yielded to a small temptation, we judge them to be weak, and our disapprobation is strong. If the temptation to which they have yielded is so great that even strong feelings of virtue might have succumbed to it, our moral reprobation is less intense. If, again, the moral desires and aversions have prevailed, but not over a very strong force, we hold that the action was good, but that there was little merit in it; and our estimate of the merit rises, in exact proportion to the greatness of the obstacle which the moral feeling proved strong enough to overcome.

UTILITARIANISM.

CHAPTER II.

WHAT UTILITARIANISM IS.

The creed which accepts as the foundation of morals, Utility, or the Greatest Happiness Principle, holds that actions are right in proportion as they tend to promote happiness, wrong as they tend to produce the reverse of happiness. By happiness is intended pleasure, and the absence of pain; by unhappiness, pain, and the privation of pleasure. To give a clear view of the moral standard set up by the theory, much more requires to be said; in particular, what things it includes in the ideas of pain and pleasure; and to what extent this is left an open question. But these

supplementary explanations do not affect the theory of life on which this theory of morality is grounded—namely, that pleasure, and freedom from pain, are the only things desirable as ends; and that all desirable things (which are as numerous in the utilitarian as in any other scheme) are desirable either for the pleasure inherent in themselves, or as means to the promotion of pleasure and the prevention of pain.

Utilitarian writers in general have placed the superiority of mental over bodily pleasures chiefly in the greater permanency, safety, uncostliness, &c., of the former—that is, in their circumstantial advantages rather than in their intrinsic nature. And on all these points utilitarians have fully proved their case; but they might have taken the other, and, as it may be called, higher ground, with entire consistency. It is quite compatible with the principle of utility to recognise the fact, that some *kinds* of pleasure are more desirable and more valuable than others. It would be absurd that while, in estimating all other things, quality is considered as well as quantity, the estimation of pleasures should be supposed to depend on quantity alone.

If I am asked, what I mean by difference of quality in pleasures, or what makes one pleasure more valuable than another, merely as a pleasure, except its being greater in amount, there is but one possible answer. Of two pleasures, if there be one to which all or almost all who have experience of both give a decided preference, irrespective of any feeling of moral obligation to prefer it, that is the more desirable pleasure. If one of the two is, by those who are competently acquainted with both, placed so far above the other that they prefer it, even though knowing it to be attended with a greater amount of discontent, and would not resign it for any quantity of the other pleasure which their nature is capable of, we are justified in ascribing to the preferred enjoyment a superiority in quality, so far outweighing quantity as to render it, in comparison, of small account.

Now it is an unquestionable fact that those who are equally acquainted with, and equally capable of appreciating and enjoying, both, do give a most marked preference to the manner of existence which employs their higher faculties. Few human

creatures would consent to be changed into any of the lower animals, for a promise of the fullest allowance of a beast's pleasures; no intelligent human being would consent to be a fool, no instructed person would be an ignoramus, no person of feeling and conscience would be selfish and base, even though they should be persuaded that the fool, the dunce, or the rascal is better satisfied with his lot than they are with theirs. They would not resign what they possess more than he, for the most complete satisfaction of all the desires which they have in common with him. If they ever fancy they would, it is only in cases of unhappiness so extreme, that to escape from it they would exchange their lot for almost any other, however undesirable in their own eyes. A being of higher faculties requires more to make him happy, is capable probably of more acute suffering, and is certainly accessible to it at more points, than one of an inferior type; but in spite of these liabilities, he can never really wish to sink into what he feels to be a lower grade of existence. We may give what explanation we please of this unwillingness; we may attribute it to pride, a name which is given indiscriminately to some of the most and to some of the least estimable feelings of which mankind are capable; we may refer it to the love of liberty and personal independence, an appeal to which was with the Stoicks one of the most effective means for the inculcation of it; to the love of power, or to the love of excitement, both of which do really enter into and contribute to it: but its most appropriate appellation is a sense of dignity, which all human beings possess in one form or other, and in some, though by no means in exact, proportion to their higher faculties, and which is so essential a part of the happiness of those in whom it is strong, that nothing which conflicts with it could be, otherwise than momentarily, an object of desire to them. Whoever supposes that this preference takes place at a sacrifice of happiness—that the superior being, in anything like equal circumstances, is not happier than the inferior—confounds the two very different ideas, of happiness, and content. It is indisputable that the being whose capacities of enjoyment are low, has the greatest chance of having them fully satisfied; and a highly-endowed being will always feel that any

happiness which he can look for, as the world is constituted, is imperfect. But he can learn to bear its imperfections, if they are at all bearable; and they will not make him envy the being who is indeed unconscious of the imperfections, but only because he feels not at all the good which those imperfections qualify. It is better to be a human being dissatisfied than a pig satisfied; better to be Socrates dissatisfied than a fool satisfied. And if the fool, or the pig, is of a different opinion, it is because they only know their own side of the question. The other party to the comparison knows both sides.

It may be objected that many who are capable of the higher pleasures, occasionally, under the influence of temptation, postpone them to the lower. But this is quite compatible with a full appreciation of the intrinsic superiority of the higher. Men often, from infirmity of character, make their election for the nearer good, though they know it to be the less valuable; and this no less when the choice is between two bodily pleasures, than when it is between bodily and mental. They pursue sensual indulgences to the injury of health, though perfectly aware that health is the greater good. It may be further objected, that many who begin with youthful enthusiasm for everything noble, as they advance in years sink into indolence and selfishness. But I do not believe that those who undergo this very common change, voluntarily choose the lower description of pleasures in preference to the higher. I believe that before they devote themselves exclusively to the one, they have already become incapable of the other. Capacity for the nobler feelings is in most natures, a very tender plant, easily killed, not only by hostile influences, but by mere want of sustenance; and in the majority of young persons it speedily dies away if the occupations to which their position in life has devoted them, and the society into which it has thrown them, are not favourable to keeping that higher capacity in exercise. Men lose their high aspirations as they lose their intellectual tastes, because they have not time or opportunity for indulging them; and they addict themselves to inferior pleasures, not because they deliberately prefer them, but because they are either the only ones to which they have access, or the only ones

which they are any longer capable of enjoying. It may be questioned whether any one who has remained equally susceptible to both classes of pleasures, ever knowingly and calmly preferred the lower; though many, in all ages, have broken down in an ineffectual attempt to combine both.

From this verdict of the only competent judges, I apprehend there can be no appeal. On a question which is the best worth having of two pleasures, or which of two modes of existence is the most grateful to the feelings, apart from its moral attributes and from its consequences, the judgment of those who are qualified by knowledge of both, or, if they differ, that of the majority among them, must be admitted as final. And there needs be the less hesitation to accept this judgment respecting the quality of pleasures, since there is no other tribunal to be referred to even on the question of quantity. What means are there of determining which is the acutest of two pains, or the intensest of two pleasurable sensations, except the general suffrage of those who are familiar with both? Neither pains nor pleasures are homogeneous, and pain is always heterogeneous with pleasure. What is there to decide whether a particular pleasure is worth purchasing at the cost of a particular pain, except the feelings and judgment of the experienced? When, therefore, those feelings and judgment declare the pleasures derived from the higher faculties to be preferable *in kind*, apart from the question of intensity, to those of which the animal nature, disjoined from the higher faculties, is susceptible, they are entitled on this subject to the same regard.

I have dwelt on this point as being a necessary part of a perfectly just conception of Utility or Happiness, considered as the directive rule of human conduct. But it is by no means an indispensable condition to the acceptance of the utilitarian standard; for that standard is not the agent's own greatest happiness, but the greatest amount of happiness altogether; and if it may possibly be doubted whether a noble character is always the happier for its nobleness, there can be no doubt that it makes other people happier, and that the world in general is immensely a gainer by it. Utilitarianism, therefore, could only attain its end by the

general cultivation of nobleness of character, even if each individual were only benefited by the nobleness of others, and his own, so far as happiness is concerned, were a sheer deduction from the benefit. But the bare enunciation of such an absurdity as this last, renders refutation superfluous.

According to the Greatest Happiness Principle, as above explained, the ultimate end, with reference to and for the sake of which all other things are desirable (whether we are considering our own good or that of other people), is an existence exempt as far as possible from pain, and as rich as possible in enjoyments, both in point of quantity and quality; the test of quality, and the rule for measuring it against quantity, being the preference felt by those who, in their opportunities of experience, to which must be added their habits of self-consciousness and self-observation, are best furnished with the means of comparison. This, being, according to the utilitarian opinion, the end of human action, is necessarily also the standard of morality; which may accordingly be defined, the rules and precepts for human conduct, by the observance of which an existence such as has been described might be, to the greatest extent possible, secured to all mankind; and not to them only, but, so far as the nature of things admits, to the whole sentient creation.

Against this doctrine, however, arises another class of objectors, who say, that happiness in any form, cannot be the rational purpose of human life and action; because, in the first place, it is unattainable: and they contemptuously ask, What right hast thou to be happy? a question which Mr. Carlyle clenches by the addition, What right, a short time ago, hadst thou even *to be?* Next, they say, that men can do *without* happiness; that all noble human beings have felt this, and could not have become noble but by learning the lesson of Entsgen, or renunciation; which lesson, thoroughly learnt and submitted to, they affirm to be the beginning and necessary condition of all virtue.

The first of these objections would go to the root of the matter were it well founded; for if no happiness is to be had at all by human beings, the attainment of it cannot be the end of morality, or of any rational conduct. Though, even in that case, some-

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thing might still be said for the utilitarian theory; since utility includes not solely the pursuit of happiness, but the prevention or mitigation of unhappiness; and if the former aim be chimerical, there will be all the greater scope and more imperative need for the latter, so long at least as mankind think fit to live, and do not take refuge in the simultaneous act of suicide recommended under certain conditions by Novalis. When, however, it is thus positively asserted to be impossible that human life should be happy, the assertion, if not something like a verbal quibble, is at least an exaggeration. If by happiness be meant a continuity of highly pleasurable excitement, it is evident enough that this is impossible. A state of exalted pleasure lasts only moments, or in some cases, and with some intermissions, hours or days, and is the occasional brilliant flash of enjoyment, not its permanent and steady flame. Of this the philosophers who have taught that happiness is the end of life were as fully aware as those who taunt them. The happiness which they meant was not a life of rapture; but moments of such, in an existence made up of few and transitory pains, many and various pleasures, with a decided predominance of the active over the passive, and having as the foundation of the whole, not to expect more from life than it is capable of bestowing. A life thus composed, to those who have been fortunate enough to obtain it, has always appeared worthy of the name of happiness. And such an existence is even now the lot of many, during some considerable portion of their lives. The present wretched education, and wretched social arrangements, are the only real hindrance to its being attainable by almost all.

The objectors perhaps may doubt whether human beings, if taught to consider happiness as the end of life, would be satisfied with such a moderate share of it. But great numbers of mankind have been satisfied with much less. The main constituents of a satisfied life appear to be two, either of which by itself is often found sufficient for the purpose: tranquillity, and excitement. With much tranquillity, many find that they can be content with very little pleasure: with much excitement, many can reconcile themselves to a considerable quantity of pain. There

is assuredly no inherent impossibility in enabling even the mass of mankind to unite both; since the two are so far from being incompatible that they are in natural alliance, the prolongation of either being a preparation for, and exciting a wish for, the other. It is only those in whom indolence amounts to a vice, that do not desire excitement after an interval of repose; it is only those in whom the need of excitement is a disease, that feel the tranquillity which follows excitement dull and insipid, instead of pleasurable in direct proportion to the excitement which preceded it. When people who are tolerably fortunate in their outward lot do not find in life sufficient enjoyment to make it valuable to them, the cause generally is, caring for nobody but themselves. To those who have neither public nor private affections, the excitements of life are much curtailed, and in any case dwindle in value as the time approaches when all selfish interests must be terminated by death: while those who leave after them objects of personal affection, and especially those who have also cultivated a fellow-feeling with the collective interests of mankind, retain as lively an interest in life on the eve of death as in the vigour of youth and health. Next to selfishness, the principal cause which makes life unsatisfactory, is want of mental cultivation. A cultivated mind—I do not mean that of a philosopher, but any mind to which the fountains of knowledge have been opened, and which has been taught, in any tolerable degree, to exercise its faculties—finds sources of inexhaustible interest in all that surrounds it; in the objects of nature, the achievements of art, the imagination of poetry, the incidents of history, the ways of mankind, past and present, and their prospects in the future. It is possible, indeed, to become indifferent to all this, and that too without having exhausted a thousandth part of it; but only when one has had from the beginning no moral or human interest in these things, and has sought in them only the gratification of curiosity.

And this leads to the true estimation of what is said by the objectors concerning the possibility, and the obligation, of learning to do without happiness. Unquestionably it is possible to do without happiness; it is done involuntarily by nineteen-twentieths

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of mankind, even in those parts of our present world which are least deep in barbarism; and it often has to be done voluntarily by the hero or the martyr, for the sake of something which he prizes more than his individual happiness. But this something, what is it, unless the happiness of others, or some of the requisites of happiness? It is noble to be capable of resigning entirely one's own portion of happiness, or chances of it: but, after all, this self-sacrifice must be for some end; it is not its own end; and if we are told that its end is not happiness, but virtue, which is better than happiness, I ask, would the sacrifice be made if the hero or martyr did not believe that it would earn for others immunity from similar sacrifices? Would it be made, if he thought that his renunciation of happiness for himself would produce no fruit for any of his fellow-creatures, but to make their lot like his, and place them also in the condition of persons who have renounced happiness? All honour to those who can abnegate for themselves the personal enjoyment of life, when by such renunciation they contribute worthily to increase the amount of happiness in the world; but he who does it, or professes to do it, for any other purpose, is no more deserving of admiration than the ascetic mounted on his pillar. He may be an inspiriting proof of what men *can* do, but assuredly not an example of what they *should*.

Though it is only in a very imperfect state of the world's arrangements that any one can best serve the happiness of others by the absolute sacrifice of his own, yet so long as the world is in that imperfect state, I fully acknowledge that the readiness to make such a sacrifice is the highest virtue which can be found in man. I will add, that in this condition of the world, paradoxical as the assertion may be, the conscious ability to do without happiness gives the best prospect of realizing such happiness as is attainable. For nothing except that consciousness can raise a person above the chances of life, by making him feel that, let fate and fortune do their worst, they have not power to subdue him: which, once felt, frees him from excess of anxiety concerning the evils of life, and enables him, like many a Stoic in the worst times of the Roman Empire, to cultivate in tranquillity the

sources of satisfaction accessible to him, without concerning himself about the uncertainty of their duration, any more than about their inevitable end.

The objectors to utilitarianism cannot always be charged with representing it in a discreditable light. On the contrary, those among them who entertain anything like a just idea of its disinterested character, sometimes find fault with its standard as being too high for humanity. They say it is exacting too much to require that people shall always act from the inducement of promoting the general interests of society. But this is to mistake the very meaning of a standard of morals, and to confound the rule of action with the motive of it. It is the business of ethics to tell us what are our duties, or by what test we may know them; but no system of ethics requires that the sole motive of all we do shall be a feeling of duty; on the contrary, ninety-nine hundredths of all our actions are done from other motives, and rightly so done, if the rule of duty does not condemn them. It is the more unjust to Utilitarianism that this particular misapprehension should be made a ground of objection to it, inasmuch as utilitarian moralists have gone beyond almost all others in affirming that the motive has nothing to do with the morality of the action, though much with the worth of the agent. He who saves a fellow-creature from drowning does what is morally right, whether his motive be duty, or the hope of being paid for his trouble: he who betrays the friend that trusts him, is guilty of a crime, even if his object be to serve another friend to whom he is under greater obligations.

An opponent, whose intellectual and moral fairness it is a pleasure to acknowledge (the Rev. J. Llewellyn Davies), has objected to this passage, saying, "Surely the rightness or wrongness of saving a man from drowning does depend very much upon the motive with which it is done. Suppose that a tyrant, when his enemy jumped into the sea to escape from him, saved him from drowning simply in order that he might inflict upon him more exquisite tortures, would it tend to clearness to speak of that rescue as 'a morally right action?' Or suppose again, according to one of the stock illustrations of ethical inquiries, that a man

betrayed a trust received from a friend, because the discharge of it would fatally injure that friend himself or some one belonging to him, would utilitarianism compel one to call the betrayal 'a crime' as much as if it had been done from the meanest motive?"

I submit, that he who saves another from drowning in order to kill him by torture afterwards, does not differ only in motive from him who does the same thing from duty or benevolence; the act itself is different. The rescue of the man is, in the case supposed, only the necessary first step of an act far more atrocious than leaving him to drown would have been. Had Mr. Davies said, "The rightness or wrongness of saving a man from drowning does depend very much"—not upon the motive, but—"upon the *intention*," no utilitarian would have differed from him. Mr. Davies, by an oversight too common not to be quite venial, has in this case confounded the very different ideas of Motive and Intention. There is no point which utilitarian thinkers (and Bentham pre-eminently) have taken more pains to illustrate than this. The morality of the action depends entirely upon the intention—that is, upon what the agent *wills to do*. But the motive, that is, the feeling which makes him will so to do, when it makes no difference in the act, makes none in the morality: though it makes a great difference in our moral estimation of the agent, especially if it indicates a good or a bad habitual *disposition*—a bent of character from which useful, or from which hurtful actions are likely to arise.

CHAPTER III.

OF THE ULTIMATE SANCTION OF THE PRINCIPLE OF UTILITY.

The question is often asked, and properly so, in regard to any supposed moral standard—What is its sanction? what are the motives to obey it? or more specifically, what is the source of its obligation? whence does it derive its binding force? It is a necessary part of moral philosophy to provide the answer to this question; which, though frequently assuming the shape of an objection to the utilitarian morality, as if it had some special applicability to

that above others, really arises in regard to all standards. The difficulty has no peculiar application to the doctrine of utility, but is inherent in every attempt to analyse morality and reduce it to principles; which, unless the principle is already in men's minds invested with as much sacredness as any of its applications, always seems to divest them of a part of their sanctity.

The principle of utility either has, or there is no reason why it might not have, all the sanctions which belong to any other system of morals. Those sanctions are either external or internal. Of the external sanctions it is not necessary to speak at any length. They are, the hope of favour and the fear of displeasure from our fellow-creatures or from the Ruler of the Universe, along with whatever we may have of sympathy or affection for them, or of love and awe of Him, inclining us to do his will independently of selfish consequences. There is evidently no reason why all these motives for observance should not attach themselves to the utilitarian morality, as completely and as powerfully as to any other. Indeed, those of them which refer to our fellow-creatures are sure to do so, in proportion to the amount of general intelligence; for whether there be any other ground of moral obligation than the general happiness or not, men do desire happiness; and however imperfect may be their own practice, they desire and commend all conduct in others towards themselves, by which they think their happiness is promoted. With regard to the religious motive, if men believe, as most profess to do, in the goodness of God, those who think that conduciveness to the general happiness is the essence, or even only the criterion, of good, must necessarily believe that it is also that which God approves. The whole force therefore of external reward and punishment, whether physical or moral, and whether proceeding from God or from our fellow men, together with all that the capacities of human nature admit, of disinterested devotion to either, become available to enforce the utilitarian morality, in proportion as that morality is recognized; and the more powerfully, the more the appliances of education and general cultivation are bent to the purpose.

So far as to external sanctions. The internal sanction of duty, whatever our standard of duty may be, is one and the same—a

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feeling in our own mind; a pain, more or less intense, attendant on violation of duty, which in properly-cultivated moral natures rises, in the more serious cases, into shrinking from it as an impossibility. This feeling, when disinterested, and connecting itself with the pure idea of duty, and not with some particular form of it, or with any of the merely accessory circumstances, is the essence of Conscience; though in that complex phenomenon as it actually exists, the simple fact is in general all encrusted over with collateral associations, derived from sympathy, from love, and still more from fear; from all the forms of religious feeling; from the recollections of childhood and of all our past life; from self-esteem, desire of the esteem of others, and occasionally even self-abasement. This extreme complication is, I apprehend, the origin of the sort of mystical character which, by a tendency of the human mind of which there are many other examples, is apt to be attributed to the idea of moral obligation, and which leads people to believe that the idea cannot possibly attach itself to any other objects than those which, by a supposed mysterious law, are found in our present experience to excite it. Its binding force, however, consists in the existence of a mass of feeling which must be broken through in order to do what violates our standard of right, and which, if we do nevertheless violate that standard, will probably have to be encountered afterwards in the form of remorse. Whatever theory we have of the nature or origin of conscience, this is what essentially constitutes it.

The ultimate sanction, therefore, of all morality (external motives apart) being a subjective feeling in our own minds, I see nothing embarrassing to those whose standard is utility, in the question, what is the sanction of that particular standard? We may answer, the same as of all other moral standards—the conscientious feelings of mankind. Undoubtedly this sanction has no binding efficacy on those who do not possess the feelings it appeals to; but neither will these persons be more obedient to any other moral principle than to the utilitarian one. On them morality of any kind has no hold but through the external sanctions. Meanwhile the feelings exist, a fact in human nature, the reality of which, and the great power with which they are ca-

pable of acting on those in whom they have been duly cultivated, are proved by experience. No reason has ever been shown why they may not be cultivated to as great intensity in connection with the utilitarian, as with any other rule of morals.

It is not necessary, for the present purpose, to decide whether the feeling of duty is innate or implanted. Assuming it to be innate, it is an open question to what objects it naturally attaches itself; for the philosophic supporters of that theory are now agreed that the intuitive perception is of principles of morality, and not of the details. If there be anything innate in the matter, I see no reason why the feeling which is innate should not be that of regard to the pleasures and pains of others. If there is any principle of morals which is intuitively obligatory, I should say it must be that. If so, the intuitive ethics would coincide with the utilitarian, and there would be no further quarrel between them. Even as it is, the intuitive moralists, though they believe that there are other intuitive moral obligations, do already believe this to be one; for they unanimously hold that a large portion of morality turns upon the consideration due to the interests of our fellow-creatures. Therefore, if the belief in the transcendental origin of moral obligation gives any additional efficacy to the internal sanction, it appears to me that the utilitarian principle has already the benefit of it.

On the other hand, if, as is my own belief, the moral feelings are not innate, but acquired, they are not for that reason the less natural. It is natural to man to speak, to reason, to build cities, to cultivate the ground, though these are acquired faculties. The moral feelings are not indeed a part of our nature, in the sense of being in any perceptible degree present in all of us; but this unhappily is a fact admitted by those who believe the most strenuously in their transcendental origin. Like the other acquired capacities above referred to, the moral faculty, if not a part of our nature, is a natural outgrowth from it; capable, like them, in a certain small degree, of springing up spontaneously; and susceptible of being brought by cultivation to a high degree of development. Unhappily it is also susceptible, by a sufficient use of the external sanctions and of the force of early impressions, of being cultivated

in almost any direction: so that there is hardly anything so absurd or so mischievous that it may not, by means of these influences, be made to act on the human mind with all the authority of conscience. To doubt that the same potency might be given by the same means to the principle of utility, even if it had no foundation in human nature, would be flying in the face of all experience.

But moral associations which are wholly of artificial creation, when intellectual culture goes on, yield by degrees to the dissolving force of analysis: and if the feeling of duty, when associated with utility, would appear equally arbitrary; if there were no leading department of our nature, no powerful class of sentiments, with which that association would harmonize, which would make us feel it congenial, and incline us not only to foster it in others (for which we have abundant interested motives), but also to cherish it in ourselves; if there were not, in short, a natural basis of sentiment for utilitarian morality, it might well happen that this association also, even after it had been implanted by education, might be analysed away.

But there *is* this basis of powerful natural sentiment; and this it is which, when once the general happiness is recognised as the ethical standard, will constitute the strength of the utilitarian morality. This firm foundation is that of the social feelings of mankind; the desire to be in unity with our fellow-creatures, which is already a powerful principle in human nature, and happily one of those which tend to become stronger, even without express inculcation, from the influences of advancing civilization. The social state is at once so natural, so necessary, and so habitual to man, that, except in some unusual circumstances or by an effort of voluntary abstraction, he never conceives himself otherwise than as a member of a body; and this association is riveted more and more, as mankind are further removed from the state of savage independence. Any condition, therefore, which is essential to a state of society, becomes more and more an inseparable part of every person's conception of the state of things which he is born into, and which is the destiny of a human being. Now, society between human beings, except in the relation of

master and slave, is manifestly impossible on any other footing than that the interests of all are to be consulted. Society between equals can only exist on the understanding that the interests of all are to be regarded equally. And since in all states of civilization, every person, except an absolute monarch, has equals, every one is obliged to live on these terms with somebody; and in every age some advance is made towards a state in which it will be impossible to live permanently on other terms with anybody. In this way people grow up unable to conceive as possible to them a state of total disregard of other people's interests. They are under a necessity of conceiving themselves as at least abstaining from all the grosser injuries, and (if only for their own protection) living in a state of constant protest against them. They are also familiar with the fact of co-operating with others, and proposing to themselves a collective, not an individual, interest, as the aim (at least for the time being) of their actions. So long as they are co-operating, their ends are identified with those of others; there is at least a temporary feeling that the interests of others are their own interests. Not only does all strengthening of social ties, and all healthy growth of society, give to each individual a stronger personal interest in practically consulting the welfare of others; it also leads him to identify his *feelings* more and more with their good, or at least with an ever greater degree of practical consideration for it. He comes, as though instinctively, to be conscious of himself as a being who *of course* pays regard to others. The good of others becomes to him a thing naturally and necessarily to be attended to, like any of the physical conditions of our existence. Now, whatever amount of this feeling a person has, he is urged by the strongest motives both of interest and of sympathy to demonstrate it, and to the utmost of his power encourage it in others; and even if he has none of it himself, he is as greatly interested as any one else that others should have it. Consequently, the smallest germs of the feeling are laid hold of and nourished by the contagion of sympathy and the influences of education; and a complete web of corroborative association is woven round it, by the powerful agency of the external sanctions. This mode of conceiving ourselves and human life, as civilization

goes on, is felt to be more and more natural. Every step in political improvement renders it more so, by removing the sources of opposition of interest, and levelling those inequalities of legal privilege between individuals or classes, owing to which there are large portions of mankind whose happiness it is still practicable to disregard. In an improving state of the human mind, the influences are constantly on the increase, which tend to generate in each individual a feeling of unity with all the rest; which feeling, if perfect, would make him never think of, or desire, any beneficial condition for himself, in the benefits of which they are not included. If we now suppose this feeling of unity to be taught as a religion, and the whole force of education, of institutions, and of opinion, directed as it once was in the case of religion, to make every person grow up from infancy surrounded on all sides both by the profession and by the practice of it, I think that no one, who can realize this conception, will feel any misgiving about the sufficiency of the ultimate sanction for the Happiness of morality. To any ethical student who finds the realization difficult, I recommend, as a means of facilitating it, the second of M. Comte's two principal works, the *Système de Politique Positive*. I entertain the strongest objections to the system of politics and morals set forth in that treatise; but I think it has superabundantly shown the possibility of giving to the service of humanity, even without the aid of belief in a Providence, both the psychical power and the social efficacy of a religion: making it take hold of human life, and colour all thought, feeling, and action, in a manner of which the greatest ascendancy ever exercised by any religion may be but a type and foretaste; and of which the danger is, not that it should be insufficient, but that it should be so excessive as to interfere unduly with human freedom and individuality.

Neither is it necessary to the feeling which constitutes the binding force of the utilitarian morality on those who recognize it, to wait for those social influences which would make its obligation felt by mankind at large. In the comparatively early state of human advancement in which we now live, a person cannot indeed feel that entireness of sympathy with all others, which would make any real discordance in the general direction of their

conduct in life impossible; but already a person in whom the social feeling is at all developed, cannot bring himself to think of the rest of his fellow-creatures as struggling rivals with him for the means of happiness, whom he must desire to see defeated in their object in order that he may succeed in his. The deeply-rooted conception which every individual even now has of himself as a social being, tends to make him feel it one of his natural wants that there should be harmony between his feelings and aims and those of his fellow-creatures. If differences of opinion and of mental culture make it impossible for him to share many of their actual feelings—perhaps make him denounce and defy those feelings—he still needs to be conscious that his real aim and theirs do not conflict; that he is not opposing himself to what they really wish for, namely, their own good; but is, on the contrary, promoting it. This feeling in most individuals is much inferior in strength to their selfish feelings, and is often wanting altogether. But to those who have it, it possesses all the characters of a natural feeling. It does not present itself to their minds as a superstition of education, or a law despotically imposed by the power of society, but as an attribute which it would not be well for them to be without. This conviction is the ultimate sanction of the greatest-happiness morality. This it is which makes any mind, of well developed-feelings, work with, and not against, the outward motives to care for others, afforded by what I have called the external sanctions; and when those sanctions are wanting, or act in an opposite direction, constitutes in itself a powerful internal binding force, in proportion to the sensitiveness and thoughtfulness of the character; since few but those whose mind is a moral blank, could bear to lay out their course of life on the plan of paying no regard to others except so far as their own private interest compels.

CHAPTER IV.

OF WHAT SOURCE OF PROOF THE PRINCIPLE OF UTILITY IS SUSCEPTIBLE.

The only proof capable of being given that an object is visible, is that people actually see it. The only proof that a sound is

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audible, is that people hear it: and so of the other sources of our experience. In like manner, I apprehend, the sole evidence it is possible to produce that anything is desirable, is that people do actually desire it. If the end which the utilitarian doctrine proposes to itself were not, in theory, and in practice, acknowledged to be an end, nothing could ever convince any person that it was so. No reason can be given why the general happiness is desirable, except that each person, so far as he believes it to be attainable, desires his own happiness. This, however, being a fact, we have not only all the proof which the case admits of, but all which it is possible to require, that happiness is a good: that each person's happiness is a good to that person, and the general happiness therefore a good to the aggregate of all persons. Happiness has made out its title as *one* of the ends of conduct, and consequently one of the criteria of morality.

But it has not, by this alone, proved itself to be the sole criterion. To do that, it would seem, by the same rule, necessary to show, not only that people desire happiness, but that they never desire anything else. Now it is palpable that they do desire things which, in common language, are decidedly distinguished from happiness. They desire, for example, virtue, and the absence of vice, no less really than pleasure and the absence of pain. The desire of virtue is not as universal, but it is as authentic a fact, as the desire of happiness. And hence the opponents of the utilitarian standard deem that they have a right to infer that there are other ends of human action besides happiness, and that happiness is not the standard of approbation and disapprobation.

But does the utilitarian doctrine deny that people desire virtue, or maintain that virtue is not a thing to be desired? The very reverse. It maintains not only that virtue is to be desired, but that it is to be desired disinterestedly, for itself. Whatever may be the opinion of utilitarian moralists as to the original conditions by which virtue is made virtue; however they may believe (as they do) that actions and dispositions are only virtuous because they promote another end than virtue; yet this being granted, and it having been decided, from considerations of this description, what *is* virtuous, they not only place virtue at the very head

of the things which are good as means to the ultimate end, but they also recognise as a psychological fact the possibility of its being, to the individual, a good in itself, without looking to any end beyond it; and hold, that the mind is not in a right state, not in a state conformable to Utility, not in the state most conducive to the general happiness, unless it does love virtue in this manner—as a thing desirable in itself, even although, in the individual instance, it should not produce those other desirable consequences which it tends to produce, and on account of which it is held to be virtue. This opinion is not, in the smallest degree, a departure from the Happiness principle. The ingredients of happiness are very various, and each of them is desirable in itself, and not merely when considered as swelling an aggregate. The principle of Utility does not mean that any given pleasure, as music, for example, or any given exemption from pain, as for example health, are to be looked upon as means to a collective something termed happiness, and to be desired on that account. They are desired and desirable in and for themselves; besides being means, they are a part of the end. Virtue, according to the utilitarian doctrine, is not naturally and originally part of the end, but it is capable of becoming so; and in those who love it disinterestedly it has become so, and is desired and cherished, not as a means to happiness, but as a part of their happiness.

To illustrate this farther, we may remember that virtue is not the only thing, originally a means, and which if it were not a means to anything else, would be and remain indifferent, but which by association of what it is a means to, comes to be desired for itself, and that too with the utmost intensity. What, for example, shall we say of the love of money? There is nothing originally more desirable about money than about any heap of glittering pebbles. Its worth is solely that of the things which it will buy; the desires for other things than itself, which it is a means of gratifying. Yet the love of money is not only one of the strongest moving forces of human life, but money is, in many cases, desired in and for itself; the desire to possess it is often stronger than the desire to use it, and goes on increasing when all the desires which point to ends beyond it, to be compassed by it, are falling off. It may

be then said truly, that money is desired not for the sake of an end, but as part of the end. From being a means to happiness, it has come to be itself a principal ingredient of the individual's conception of happiness. The same may be said of the majority of the great objects of human life—power, for example, or fame; except that to each of these there is a certain amount of immediate pleasure annexed, which has at least the semblance of being naturally inherent in them; a thing which cannot be said of money. Still, however, the strongest natural attraction, both of power and of fame, is the immense aid they give to the attainment of our other wishes; and it is the strong association thus generated between them and all our objects of desire, which gives to the direct desire of them the intensity it often assumes, so as in some characters to surpass in strength all other desires. In these cases the means have become a part of the end, and a more important part or it, than any of the things which they are means to. What was once desired as an instrument for the attainment of happiness, has come to be desired for its own sake. In being desired for its own sake it is, however, desired as *part* of happiness. The person is made, or thinks he would be made, happy by its mere possession; and is made unhappy by failure to obtain it. The desire of it is not a different thing from the desire of happiness, any more than the love of music, or the desire of health. They are included in happiness. They are some of the elements of which the desire of happiness is made up. Happiness is not an abstract idea, but a concrete whole; and these are some of its parts. And the utilitarian standard sanctions and approves their being so. Life would be a poor thing, very ill provided with sources of happiness, if there were not this provision of nature, by which things originally indifferent, but conducive to, or otherwise associated with, the satisfaction of our primitive desires, become in themselves sources of pleasure more valuable than primitive pleasures, both in permanency, in the space of human existence that they are capable of covering, and even in intensity.

Virtue, according to the utilitarian conception, is a good of this description. There was no original desire of it, or motive to it, save its conduciveness to pleasure, and especially to protection

from pain. But through the association thus formed, it may be felt a good in itself, and desired as such with as great intensity as any other good; and with this difference between it and the love of money, of power, or of fame, that all of these may, and often do, render the individual noxious to the other members of the society to which he belongs, whereas there is nothing which makes him so much a blessing to them as the cultivation of the disinterested love of virtue. And consequently, the utilitarian standard, while it tolerates and approves those other acquired desires, up to the point beyond which they would be more injurious to the general happiness than promotive of it, enjoins and requires the cultivation of the love of virtue up to the greatest strength possible, as being above all things important to the general happiness.

It results from the preceding considerations, that there is in reality nothing desired except happiness. Whatever is desired otherwise than as a means to some end beyond itself, and ultimately to happiness, is desired as itself a part of happiness, and is not desired for itself until it has become so. Those who desire virtue for its own sake, desire it either because the consciousness of it is a pleasure, or because the consciousness of being without it is a pain, or for both reasons united; as in truth the pleasure and pain seldom exist separately, but almost always together, the same person feeling pleasure in the degree of virtue attained, and pain in not having attained more. If one of these gave him no pleasure, and the other no pain, he would not love or desire virtue, or would desire it only for the other benefits which it might produce to himself or to persons whom he cared for.

We have now, then, an answer to the question, of what sort of proof the principle of utility is susceptible. If the opinion which I have now stated is psychologically true—if human nature is so constituted as to desire nothing which is not either a part of happiness or a means of happiness, we can have no other proof, and we require no other, that these are the only things desirable. If so, happiness is the sole end of human action, and the promotion of it the test by which to judge of all human conduct; from whence it necessarily follows that it must be the criterion of morality, since a part is included in the whole.

And now to decide whether this is really so; whether mankind do desire nothing for itself but that which is a pleasure to them, or of which the absence is a pain; we have evidently arrived at a question of fact and experience, dependent, like all similar questions, upon evidence. It can only be determined by practised self-consciousness and self-observation, assisted by observation of others. I believe that these sources of evidence, impartially consulted, will declare that desiring a thing and finding it pleasant, aversion to it and thinking of it as painful, are phenomena entirely inseparable, or rather two parts of the same phenomenon; in strictness of language, two different modes of naming the same psychological fact: that to think of an object as desirable (unless for the sake of its consequences), and to think of it as pleasant, are one and the same thing; and that to desire anything, except in proportion as the idea of it is pleasant, is a physical and metaphysical impossibility.

CHAPTER V.

ON THE CONNEXION BETWEEN JUSTICE AND UTILITY.

Mankind are always pre-disposed to believe that any subjective feeling, not otherwise accounted for, is a revelation of some objective reality. Our present object is to determine whether the reality, to which the feeling of justice corresponds, is one which needs any such special revelation; whether the justice or injustice of an action is a thing intrinsically peculiar, and distinct from all its other qualities, or only a combination of certain of those qualities, presented under a peculiar aspect. For the purpose of this inquiry, it is practically important to consider whether the feeling itself, of justice and injustice, is *sui generis* like our sensations of colour and taste, or a derivative feeling, formed by a combination of others. And this is the more essential to examine, as people are in general willing enough to allow, that objectively the dictates of justice coincide with a part of the field of General Expediency; but inasmuch as the subjective mental feeling of Justice is different from that which commonly attaches to simple expediency, and, except in extreme cases of the latter, is far more

imperative in its demands, people find it difficult to see, in Justice, only a particular kind or branch of general utility, and think that its superior binding force requires a totally different origin.

To find the common attributes of a variety of objects, it is necessary to begin by surveying the objects themselves in the concrete. Let us therefore advert successively to the various modes of action, and arrangements of human affairs, which are classed, by universal or widely spread opinion, as Just or as Unjust. The things well known to excite the sentiments associated with those names, are of a very multifarious character. I shall pass them rapidly in review, without studying any particular arrangement.

In the first place, it is mostly considered unjust to deprive any one of his personal liberty, his property, or any other thing which belongs to him by law. Here, therefore, is one instance of the application of the terms just and unjust in a perfectly definite sense, namely, that it is just to respect, unjust to violate, the *legal rights* of any one. But this judgment admits of several exceptions, arising from the other forms in which the notions of justice and injustice present themselves. For example, the person who suffers the deprivation may (as the phrase is) have *forfeited* the rights which he is so deprived of: a case to which we shall return presently. But also,

Secondly; the legal rights of which he is deprived, may be rights which *ought* not to have belonged to him; in other words, the law which confers on him these rights, may be a bad law. When it is so, or when (which is the same thing for our purpose) it is supposed to be so, opinions will differ as to the justice or injustice of infringing it. Some maintain that no law, however bad, ought to be disobeyed by an individual citizen; that his opposition to it, if shown at all, should only be shown in endeavouring to get it altered by competent authority. This opinion (which condemns many of the most illustrious benefactors of mankind, and would often protect pernicious institutions against the only weapons which, in the state of things existing at the time, have any chance of succeeding against them) is defended, by those who hold it, on grounds of expediency; principally on that of the

importance, to the common interest of mankind, of maintaining inviolate the sentiment of submission to law. Other persons, again, hold the directly contrary opinion, that any law judged to be bad, may blamelessly be disobeyed, even though it be not judged to be unjust, but only inexpedient; while others would confine the licence of disobedience to the case of unjust laws; but again, some say, that all laws which are inexpedient are unjust; since every law imposes some restriction on the natural liberty of mankind, which restriction is an injustice, unless legitimated by tending to their good. Among these diversities of opinion, it seems to be universally admitted that there may be unjust laws, and that law, consequently, is not the ultimate criterion of justice, but may give to one person a benefit or impose on another an evil, which justice condemns. When, however, a law is thought to be unjust, it seems always to be regarded as being so in the same way in which a breach of law is unjust, namely, by infringing somebody's right; which, as it cannot in this case be a legal right, receives a different appellation, and is called a moral right. We may say, therefore, that a second case of injustice consists in taking or withholding from any person that to which he has a *moral right*.

Thirdly, it is universally considered just that each person should obtain that (whether good or evil) which he *deserves*; and unjust that he should obtain a good, or be made to undergo an evil, which he does not deserve. This is, perhaps, the clearest and most emphatic form in which the idea of justice is conceived by the general mind. As it involves the notion of desert, the question arises, what constitutes desert? Speaking in a general way, a person is understood to deserve good if he does right, evil if he does wrong; and in a more particular sense, to deserve good from those to whom he does or has done good, and evil from those to whom he does or has done evil. The precept of returning good for evil has never been regarded as a case of the fulfilment of justice, but as one in which the claims of justice are waived, in obedience to other considerations.

Fourthly, it is confessedly unjust to *break faith* with any one: to violate an engagement, either expressed or implied, or dis-

point expectations raised by our own conduct, at least if we have raised those expectations knowingly and voluntarily. Like the other obligations of justice already spoken of, this one is not regarded as absolute, but as capable of being overruled by a stronger obligation of justice on the other side; or by such conduct on the part of the person concerned as is deemed to absolve us from our obligation to him, and to constitute a *forfeiture* of the benefit which he has been led to expect.

Fifthly, it is, by universal admission, inconsistent with justice to be *partial*; to show favour or preference to one person over another, in matters to which favour and preference do not properly apply. Impartiality, however, does not seem to be regarded as a duty in itself, but rather as instrumental to some other duty; for it is admitted that favour and preference are not always censurable, and indeed the cases in which they are condemned are rather the exception than the rule. A person would be more likely to be blamed than applauded for giving his family or friends no superiority in good offices over strangers, when he could do so without violating any other duty; and no one thinks it unjust to seek one person in preference to another as a friend, connexion, or companion. Impartiality where rights are concerned is of course obligatory, but this is involved in the more general obligation of giving to every one his right. A tribunal, for example, must be impartial, because it is bound to award, without regard to any other consideration, a disputed object to the one of two parties who has the right to it. There are other cases in which impartiality means, being solely influenced by desert; as with those who, in the capacity of judges, preceptors, or parents, administer reward and punishment as such. There are cases, again, in which it means, being solely influenced by consideration for the public interest; as in making a selection among candidates for a Government employment. Impartiality, in short, as an obligation of justice, may be said to mean, being exclusively influenced by the considerations which it is supposed ought to influence the particular case in hand; and resisting the solicitation of any motives which prompt to conduct different from what those considerations would dictate.

Nearly allied to the idea of impartiality, is that of *equality*; which often enters as a component part both into the conception of justice and into the practice of it, and, in the eyes of many persons, constitutes its essence. But in this, still more than in any other case, the notion of justice varies in different persons, and always conforms in its variations to their notion of utility. Each person maintains that equality is the dictate of justice, except where he thinks that expediency requires inequality. The justice of giving equal protection to the rights of all, is maintained by those who support the most outrageous inequality in the rights themselves. Even in slave countries it is theoretically admitted that the rights of the slave, such as they are, ought to be as sacred as those of the master; and that a tribunal which fails to enforce them with equal strictness is wanting in justice; while, at the same time, institutions which leave to the slave scarcely any rights to enforce, are not deemed unjust, because they are not deemed inexpedient. Those who think that utility requires distinctions of rank, do not consider it unjust that riches and social privileges should be unequally dispensed; but those who think this inequality inexpedient, think it unjust also. Whoever thinks that government is necessary, sees no injustice in as much inequality as is constituted by giving to the magistrate powers not granted to other people. Even among those who hold levelling doctrines, there are as many questions of justice as there are differences of opinion about expediency. Some Communists consider it unjust that the produce of the labour of the community should be shared on any other principle than that of exact equality; others think it just that those should receive most whose needs are greatest; while others hold that those who work harder, or who produce more, or whose services are more valuable to the community, may justly claim a larger quota in the division of the produce. And the sense of natural justice may be plausibly appealed to in behalf of every one of these opinions.

Among so many diverse applications of the term Justice, which yet is not regarded as ambiguous, it is a matter of some difficulty to seize the mental link which holds them together and on which the moral sentiment adhering to the term essentially depends.

Perhaps, in this embarrassment, some help may be derived from the history of the word, as indicated by its etymology.

In most, if not in all, languages, the etymology of the word which corresponds to *Just*, points to an origin connected either with positive law, or with that which was in most cases the primitive form of law—authoritative custom. *Justum* is a form of *jussum*, that which has been ordered. *Jus* is of the same origin.

Δίκαιον comes from *δίκη*, of which the principal meaning, at least in the historical ages of Greece, was a suit at law. Originally, indeed, it meant only the mode or *manner* of doing things, but it early came to mean the *prescribed* manner; that which the recognized authorities, patriarchial, judicial, or political, would enforce. *Recht*, from which came *right* and *righteous*, is synonymous with law. The original meaning, indeed, of *recht* did not point to law, but to physical straightness; as *wrong* and its Latin equivalents meant twisted or *tortuous*; and from this it is argued that right did not originally mean law, but on the contrary law meant right. But however this may be, the fact that *recht* and *droit* became restricted in their meaning to positive law, although much which is not required by law is equally necessary to moral straightness or rectitude, is as significant of the original character of moral ideas as if the derivation had been the reverse way. The courts of justice, the administration of justice, are the courts and the administration of law. *La justice*, in French, is the established term for judicature. There can, I think, be no doubt that the *idée mère*, the primitive element, in the formation of the notion of justice, was conformity to law. It constituted the entire idea among the Hebrews, up to the birth of Christianity; as might be expected in the case of a people whose laws attempted to embrace all subjects on which precepts were required, and who believed those laws to be a direct emanation from the Supreme Being. But other nations, and in particular the Greeks and Romans, who knew that their laws had been made originally, and still continued to be made, by men, were not afraid to admit that those men might make bad laws; might do, by law, the same things, and from the same motives, which, if done by individuals without the sanction of law, would be called unjust. And hence the senti-

ment of injustice came to be attached, not to all violations of law, but only to violations of such laws as *ought* to exist, including such as ought to exist but do not; and to laws themselves, if supposed to be contrary to what ought to be law. In this manner the idea of law and of its injunctions was still predominant in the notion of justice, even when the laws actually in force ceased to be accepted as the standard of it.

It is true that mankind consider the idea of justice and its obligations as applicable to many things which neither are, nor is it desired that they should be, regulated by law. Nobody desires that laws should interfere with the whole detail of private life; yet every one allows that in all daily conduct a person may and does show himself to be either just or unjust. But even here, the idea of the breach of what ought to be law, still lingers in a modified shape. It would always give us pleasure, and chime in with our feelings of fitness, that acts which we deem unjust should be punished, though we do not always think it expedient that this should be done by the tribunals. We forego that gratification on account of incidental inconveniences. We should be glad to see just conduct enforced and injustice repressed, even in the minutest details, if we were not, with reason, afraid of trusting the magistrate with so unlimited an amount of power over individuals. When we think that a person is bound in justice to do a thing, it is an ordinary form of language to say, that he ought to be compelled to do it. We should be gratified to see the obligation enforced by any body who had the power. If we see that its enforcement by law would be inexpedient, we lament the impossibility, we consider the impunity given to injustice as an evil, and strive to make amends for it by bringing a strong expression of our own and the public disapprobation to bear upon the offender. Thus the idea of legal constraint is still the generating idea of the notion of justice, though undergoing several transformations before that notion, as it exists in an advanced state of society, becomes complete.

The above is, I think, a true account, as far as it goes, of the origin and progressive growth of the idea of justice. But we must observe, that it contains, as yet, nothing to distinguish that

obligation from moral obligation in general. For the truth is, that the idea of penal sanction, which is the essence of law, enters not only into the conception of injustice, but into that of any kind of wrong. We do not call anything wrong, unless we mean to imply that a person ought to be punished in some way or other for doing it; if not by law, by the opinion of his fellow-creatures; if not by opinion, by the reproaches of his own conscience. This seems the real turning point of the distinction between morality and simple expediency. It is a part of the notion of Duty in every one of its forms, that a person may rightfully be compelled to fulfil it. Duty is a thing which may be *exacted* from a person, as one exacts a debt. Unless we think that it might be exacted from him, we do not call it his duty. Reasons of prudence, or the interest of other people, may militate against actually exacting it; but the person himself, it is clearly understood, would not be entitled to complain. There are other things, on the contrary, which we wish that people should do, which we like or admire them for doing, perhaps dislike or despise them for not doing, but yet admit that they are not bound to do; it is not a case of moral obligation; we do not blame them, that is, we do not think that they are proper objects of punishment. How we come by these ideas of deserving and not deserving punishment, will appear, perhaps, in the sequel; but I think there is no doubt that this distinction lies at the bottom of the notions of right and wrong; that we call any conduct wrong, or employ, instead, some other term of dislike or disparagement, according as we think that the person ought, or ought not, to be punished for it; and we say that it would be right to do so and so, or merely that it would be desirable or laudable, according as we would wish to see the person whom it concerns, compelled, or only persuaded and exhorted, to act in that manner.

This, therefore, being the characteristic difference which marks off, not justice, but morality in general, from the remaining provinces of Expediency and Worthiness; the character is still to be sought which distinguishes justice from other branches of morality. Now it is known that ethical writers divide moral duties into two classes, denoted by the ill-chosen expressions, duties of perfect and of imperfect obligation; the latter being those in which,

though the act is obligatory, the particular occasions of performing it are left to our choice; as in the case of charity or beneficence, which we are indeed bound to practise, but not towards any definite person, nor at any prescribed time. In the more precise language of philosophic jurists, duties of perfect obligation are those duties in virtue of which a correlative *right* resides in some person or persons; duties of imperfect obligation are those moral obligations which do not give birth to any right. I think it will be found that this distinction exactly coincides with that which exists between justice and the other obligations of morality. In our survey of the various popular acceptations of justice, the term appeared generally to involve the idea of a personal right—a claim on the part of one or more individuals, like that which the law gives when it confers a proprietary or other legal right. Whether the injustice consists in depriving a person of a possession, or in breaking faith with him, or in treating him worse than he deserves, or worse than other people who have no greater claims, in each case the supposition implies two things—a wrong done, and some assignable person who is wronged. Injustice may also be done by treating a person better than others; but the wrong in this case is to his competitors, who are also assignable persons. It seems to me that this feature in the case—a right in some person, correlative to the moral obligation—constitutes the specific difference between justice, and generosity or beneficence. Justice implies something which it is not only right to do, and wrong not to do, but which some individual person can claim from us as his moral right. No one has a moral right to our generosity or beneficence, because we are not morally bound to practice those virtues towards any given individual. And it will be found with respect to this as with respect to every correct definition, that the instances which seem to conflict with it are those which most confirm it. For if a moralist attempts, as some have done, to make out that mankind generally, though not any given individual, have a right to all the good we can do them, he at once, by that thesis, includes generosity and beneficence within the category of justice. He is obliged to say, that our utmost exertions are *due* to our fellow-creatures, thus as-

similating them to a debt; or that nothing less can be a sufficient return for what society does for us, thus classing the case as one of gratitude; both of which are acknowledged cases of justice. Wherever there is a right, the case is one of justice, and not of the virtue of beneficence: and whoever does not place the distinction between justice and morality in general where we have now placed it, will be found to make no distinction between them at all, but to merge all morality in justice.

Having thus endeavoured to determine the distinctive elements which enter into the composition of the idea of justice, we are ready to enter on the inquiry, whether the feeling, which accompanies the idea, is attached to it by a special dispensation of nature, or whether it could have grown up, by any known laws, out of the idea itself; and in particular, whether it can have originated in considerations of general expediency.

I conceive that the sentiment itself does not arise from anything which would commonly, or correctly, be termed an idea of expediency; but that, though the sentiment does not, whatever is moral in it does.

We have seen that the two essential ingredients in the sentiment of justice are, the desire to punish a person who has done harm, and the knowledge or belief that there is some definite individual or individuals to whom harm has been done.

Now it appears to me, that the desire to punish a person who has done harm to some individual, is a spontaneous outgrowth from two sentiments, both in the highest degree natural, and which either are or resemble instincts; the impulse of self-defence, and the feeling of sympathy.

It is natural to resent, and to repel or retaliate, any harm done or attempted against ourselves, or against those with whom we sympathise. The origin of this sentiment it is not necessary here to discuss. Whether it be an instinct or a result of intelligence, it is, we know, common to all animal nature; for every animal tries to hurt those who have hurt, or who it thinks are about to hurt, itself or its young. Human beings, on this point, only differ from other animals in two particulars. First, in being capable of sympathising, not solely with their offspring, or, like some of the

more noble animals, with some superior animal who is kind to them, but with all human, and even with all sentient beings. Secondly, in having a more developed intelligence, which gives a wider range to the whole of their sentiments, whether self-regarding or sympathetic. By virtue of his superior intelligence, even apart from his superior range of sympathy, a human being is capable of apprehending a community of interest between himself and the human society of which he forms a part, such that any conduct which threatens the security of the society generally, is threatening to his own, and calls forth his instinct (if instinct it be) of self-defense. The same superiority of intelligence, joined to the power of sympathising with human beings generally, enables him to attach himself to the collective idea of his tribe, his country, or mankind, in such a manner that any act hurtful to them rouses his instinct of sympathy, and urges him to resistance.

The sentiment of justice, in that one of its elements which consists of the desire to punish, is thus, I conceive, the natural feeling of retaliation or vengeance, rendered by intellect and sympathy applicable to those injuries, that is, to those hurts, which wound us through, or in common with, society at large. This sentiment, in itself, has nothing moral in it; what is moral is, the exclusive subordination of it to the social sympathies, so as to wait on and obey their call. For the natural feeling tends to make us resent indiscriminately whatever any one does that is disagreeable to us; but when moralised by the social feeling, it only acts in the directions conformable to the general good; just persons resenting a hurt to society, though not otherwise a hurt to themselves, and not resenting a hurt to themselves, however painful, unless it be of the kind which society has a common interest with them in the repression of.

It is no objection against this doctrine to say, that when we feel our sentiment of justice outraged, we are not thinking of society at large, or of any collective interest, but only of the individual case. It is common enough certainly, though the reverse of commendable, to feel resentment merely because we have suffered pain; but a person whose resentment is really a moral feeling, that is, who considers whether an act is blameable before he

allows himself to resent it—such a person, though he may not say expressly to himself that he is standing up for the interest of society, certainly does feel that he is asserting a rule which is for the benefit of others as well as for his own. If he is not feeling this—if he is regarding the act solely as it affects him individually—he is not consciously just; he is not concerning himself about the justice of his actions. This is admitted even by anti-utilitarian moralists. When Kant (as before remarked) proounds as the fundamental principle of morals, ‘So act, that thy rule of conduct might be adopted as a law by all rational beings,’ he virtually acknowledges that the interest of mankind collectively, or at least of mankind indiscriminately, must be in the mind of the agent when conscientiously deciding on the morality of the act. Otherwise he uses words without a meaning: for, that a rule even of utter selfishness could not *possibly* be adopted by all rational beings—that there is any insuperable obstacle in the nature of things to its adoption—cannot even plausibly be maintained. To give any meaning to Kant’s principle, the sense put upon it must be, that we ought to shape our conduct by a rule which *all* rational beings might adopt *with benefit to their collective interest*.

To recapitulate: the idea of justice supposes two things; a rule of conduct, and a sentiment which sanctions the rule. The first must be supposed common to all mankind, and intended for their good. The other (the sentiment) is a desire that punishment may be suffered by those who infringe the rule. There is involved, in addition, the conception of some definite person who suffers by the infringement; whose rights (to use the expression appropriated to the case) are violated by it. And the sentiment of justice appears to me to be, the animal desire to repel or retaliate a hurt or damage to oneself, or to those with whom one sympathises, widened so as to include all persons, by the human capacity of enlarged sympathy, and the human conception of intelligent self-interest. From the latter elements the feeling derives its morality; from the former, its peculiar impressiveness, and energy of self-assertion.

I have, throughout, treated the idea of a *right* residing in the in-

jured person, and violated by the injury, not as a separate element in the composition of the idea and sentiment, but as one of the forms in which the other two elements clothe themselves. These elements are, a hurt to some assignable person or persons on the one hand, and a demand for punishment on the other. An examination of our own minds, I think, will show, that these two things include all that we mean when we speak of violation of a right. When we call anything a person's right, we mean that he has a valid claim on society to protect him in the possession of it, either by the force of law, or by that of education and opinion. If he has what we consider a sufficient claim, on whatever account, to have something guaranteed to him by society, we say that he has a right to it. If we desire to prove that anything does not belong to him by right, we think this done as soon as it is admitted that society ought not to take measures for securing it to him, but should leave it to chance, or to his own exertions. Thus, a person is said to have a right to what he can earn in a fair professional competition; because society ought not to allow any other person to hinder him from endeavouring to earn in that manner as much as he can. But he has not a right to three hundred a-year though he may happen to be earning it; because society is not called on to provide that he shall earn that sum. On the contrary, if he owns ten thousand pounds three per cent stock he has a right to three hundred a-year; because society has come under an obligation to provide him with an income of that amount.

To have a right, then, is, I conceive, to have something which society ought to defend me in the possession of. If the objector goes on to ask why it ought, I can give him no other reason than general utility. If that expression does not seem to convey a sufficient feeling of the strength of the obligation, nor to account for the peculiar energy of the feeling, it is because there goes to the composition of the sentiment, not a rational only, but also an animal element, the thirst for retaliation; and this thirst derives its intensity, as well as its moral justification, from the extraordinarily important and impressive kind of utility which is concerned. The interest involved is that of security, to every one's feelings the most vital of all interests. Nearly all other earthly

benefits are needed by one person, not needed by another; and many of them can, if necessary, be cheerfully foregone, or replaced by something else; but security no human being can possibly do without; on it we depend for all our immunity from evil, and for the whole value of all and every good, beyond the passing moment; since nothing but the gratification of the instant could be of any worth to us, if we could be deprived of everything the next instant by whoever was momentarily stronger than ourselves. Now this most indispensable of all necessaries, after physical nutriment, cannot be had, unless the machinery for providing it is kept uninterruptedly in active play. Our notion, therefore, of the claim we have on our fellow-creatures to join in making safe for us the very groundwork of our existence, gathers feelings round it so much more intense than those concerned in any of the more common cases of utility, that the difference in degree (as is often the case in psychology) becomes a real difference in kind. The claim assumes that character of absoluteness, that apparent infinity, and incommensurability with all other considerations, which constitute the distinction between the feeling of right and wrong and that of ordinary expediency and inexpediency. The feelings concerned are so powerful, and we count so positively on finding a responsive feeling in others (all being alike interested), that *ought* and should grow into *must*, and recognised indispensability becomes a moral necessity, analogous to physical and often inferior to it in binding force.

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